Part I: 21st Century Solutions to Water & Growth Challenges in the Front Range

May 11th, 11am – 12pm PT

CML | COLORADO MUNICIPAL LEAGUE

waternow alliance

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

WaterNow Alliance

WaterNow Alliance is a nonprofit network of local water leaders supporting sustainable, affordable and climate resilient water strategies.

Today's Speakers

Alexander Funk
Agricultural and Rural Resiliency Policy Specialist, Colorado Water Conservation Board

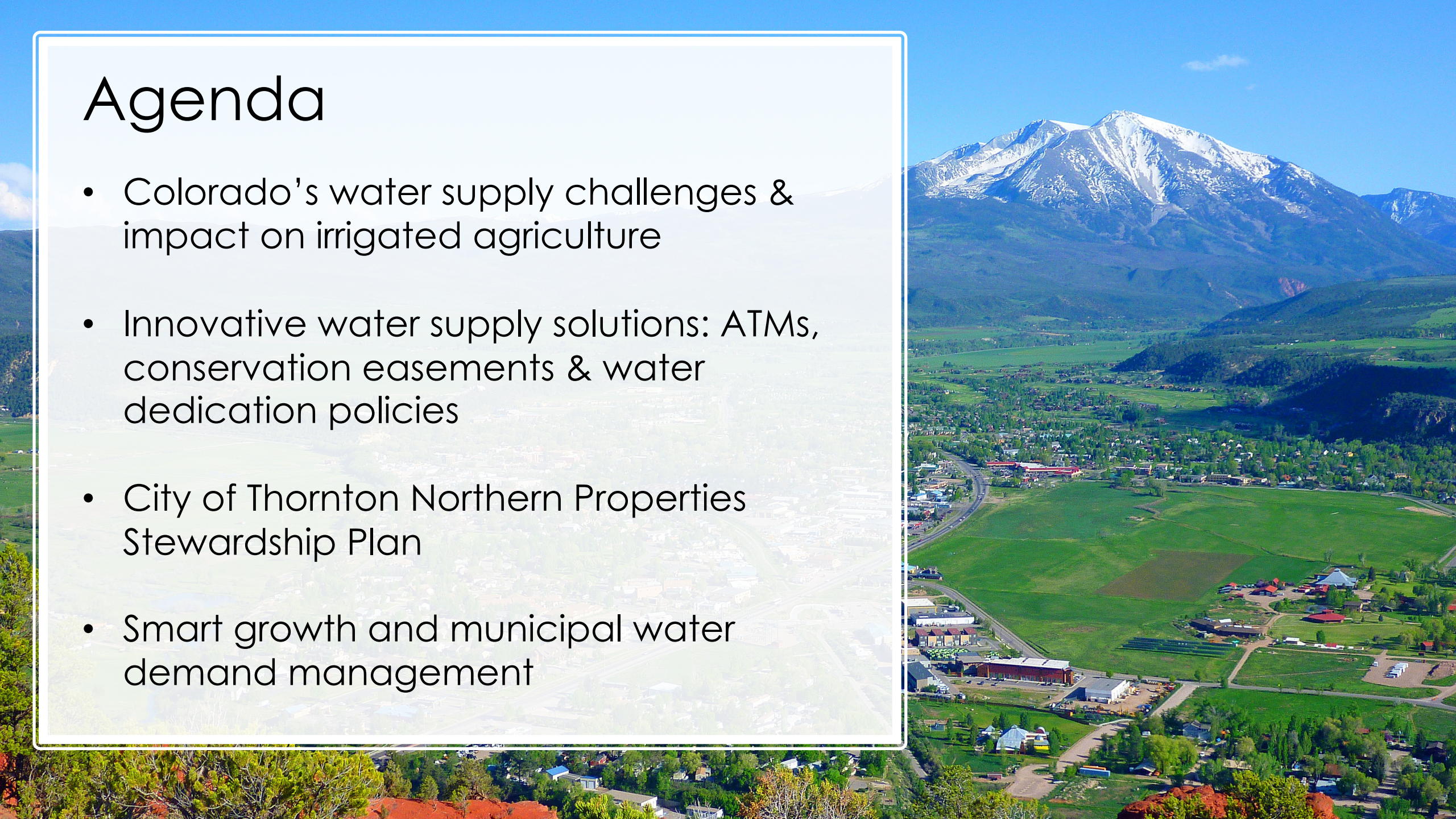
Brett Bovee
Regional Director, WestWater Research

Emily Hunt
Deputy Infrastructure Director, City of Thornton

Christy Wiseman
Land Use & Water Planner, Department of Local Affairs

Agenda

- Colorado's water supply challenges & impact on irrigated agriculture
- Innovative water supply solutions: ATMs, conservation easements & water dedication policies
- City of Thornton Northern Properties Stewardship Plan
- Smart growth and municipal water demand management



Water Supply Challenges & Innovative Water Sharing Agreements

Alexander Funk, CWCB,
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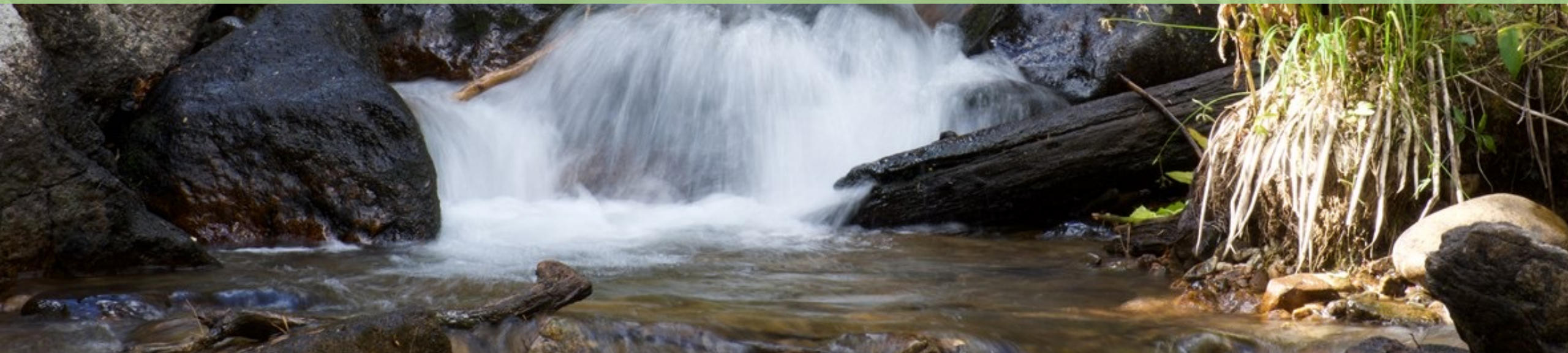
Polling Question



CO WATER CHALLENGES

8 BASINS
where major rivers flow

88% AG/FOOD PRODUCTION
8% MUNICIPALITIES
4% LARGE INDUSTRIES

5.6 MILLION PEOPLE
use water to live, work and play in Colorado

9 COMPACTS LEGALLY REQUIRE WATER TO BE DELIVERED BEYOND COLORADO'S BOARDERS

9 ROUNDTABLES
collaborate on local needs

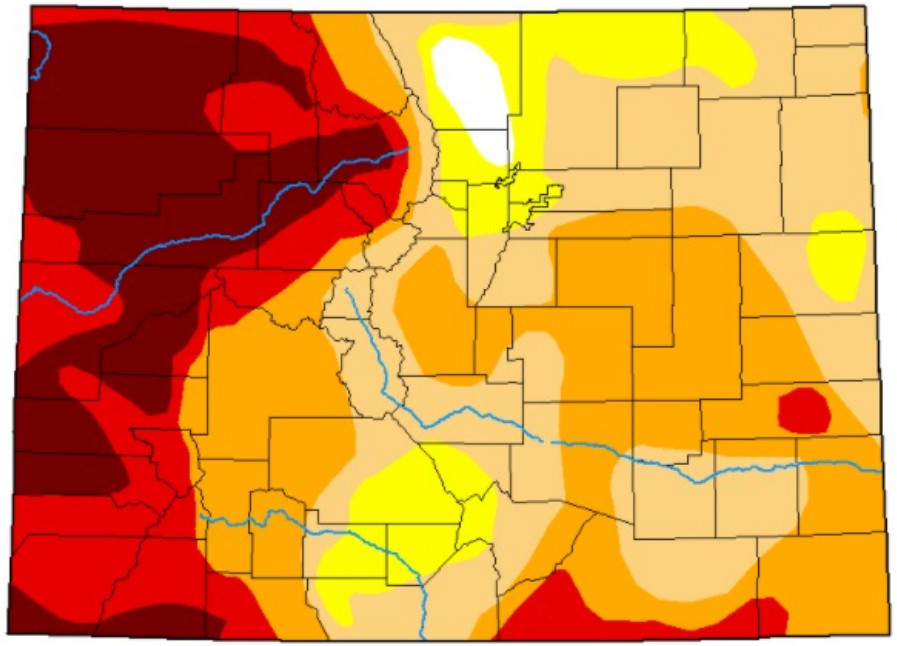
15 MAJOR INDUSTRIES
depend on water for growth and success

UP TO 33% OF IRRIGATED LAND COULD BE DRIED UP BY 2050 TO MEET NEW MUNICIPAL DEMANDS

US DROUGHT MONITOR

Colorado

Current Map > Colorado



Map released: Thurs. April 29, 2021

Data valid: April 27, 2021 at 8 a.m. EDT

Intensity:

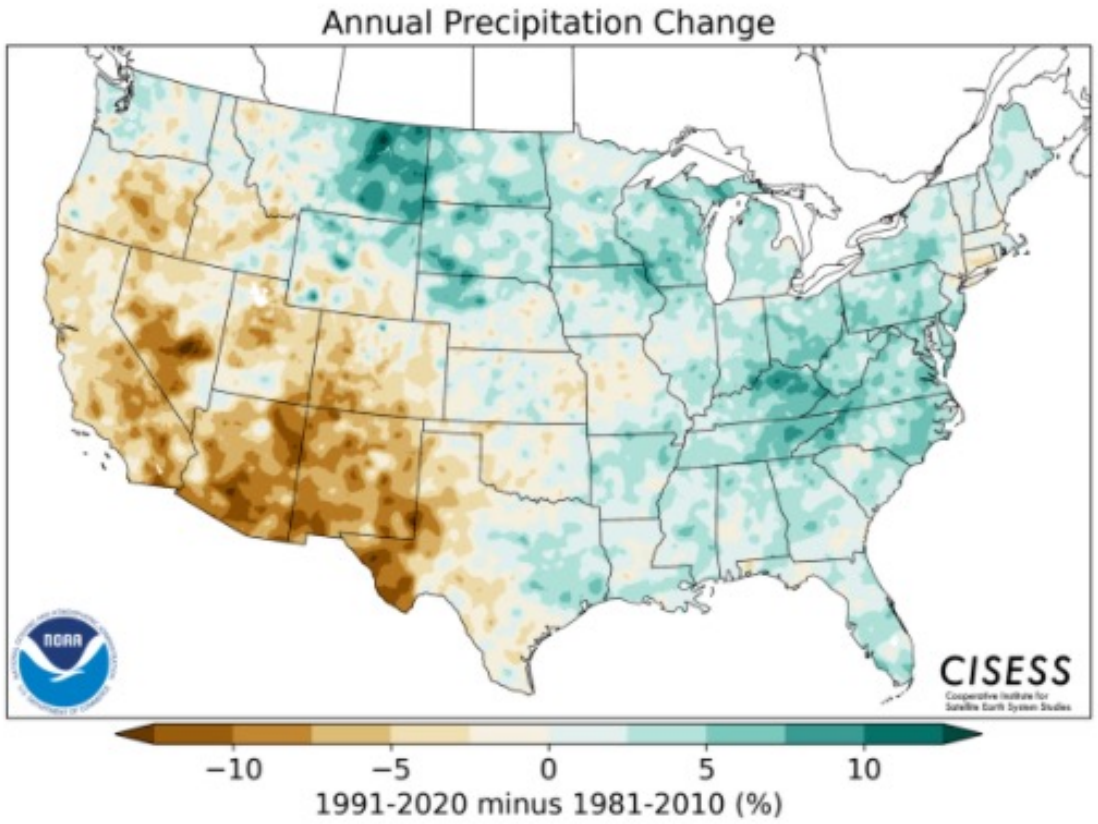
- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

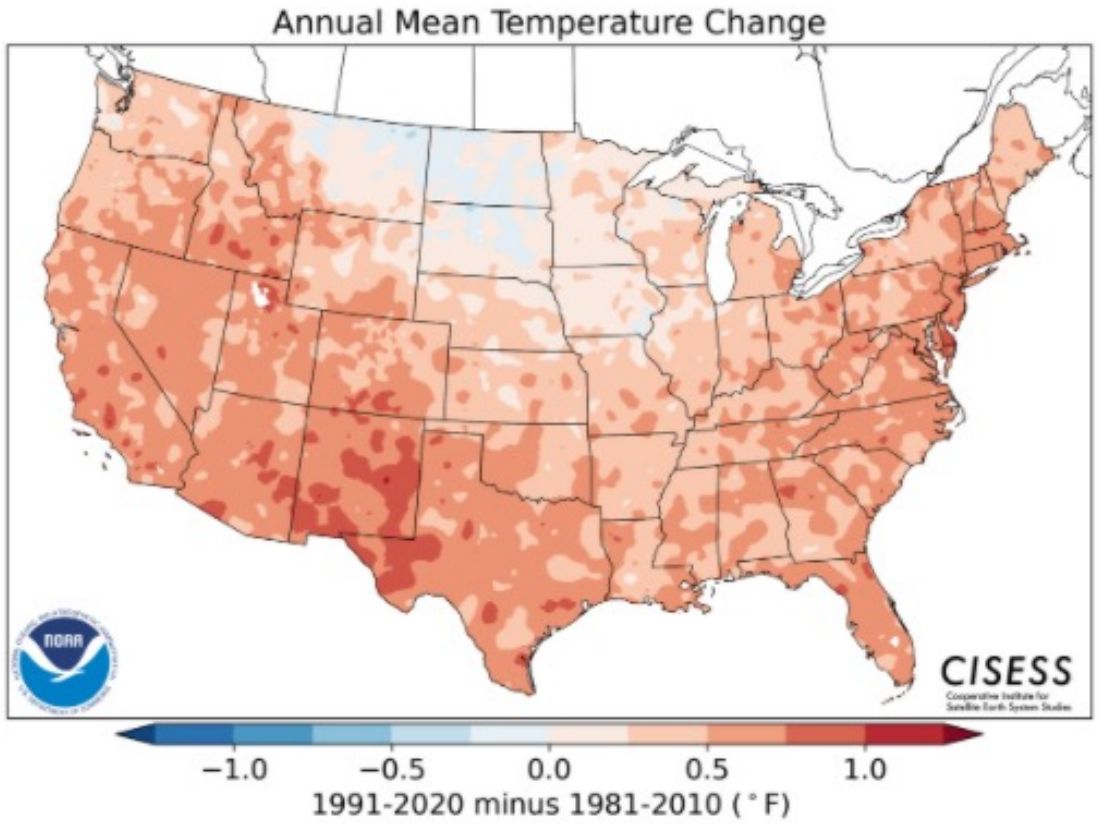
Author(s):

Richard Heim, NOAA/NCEI

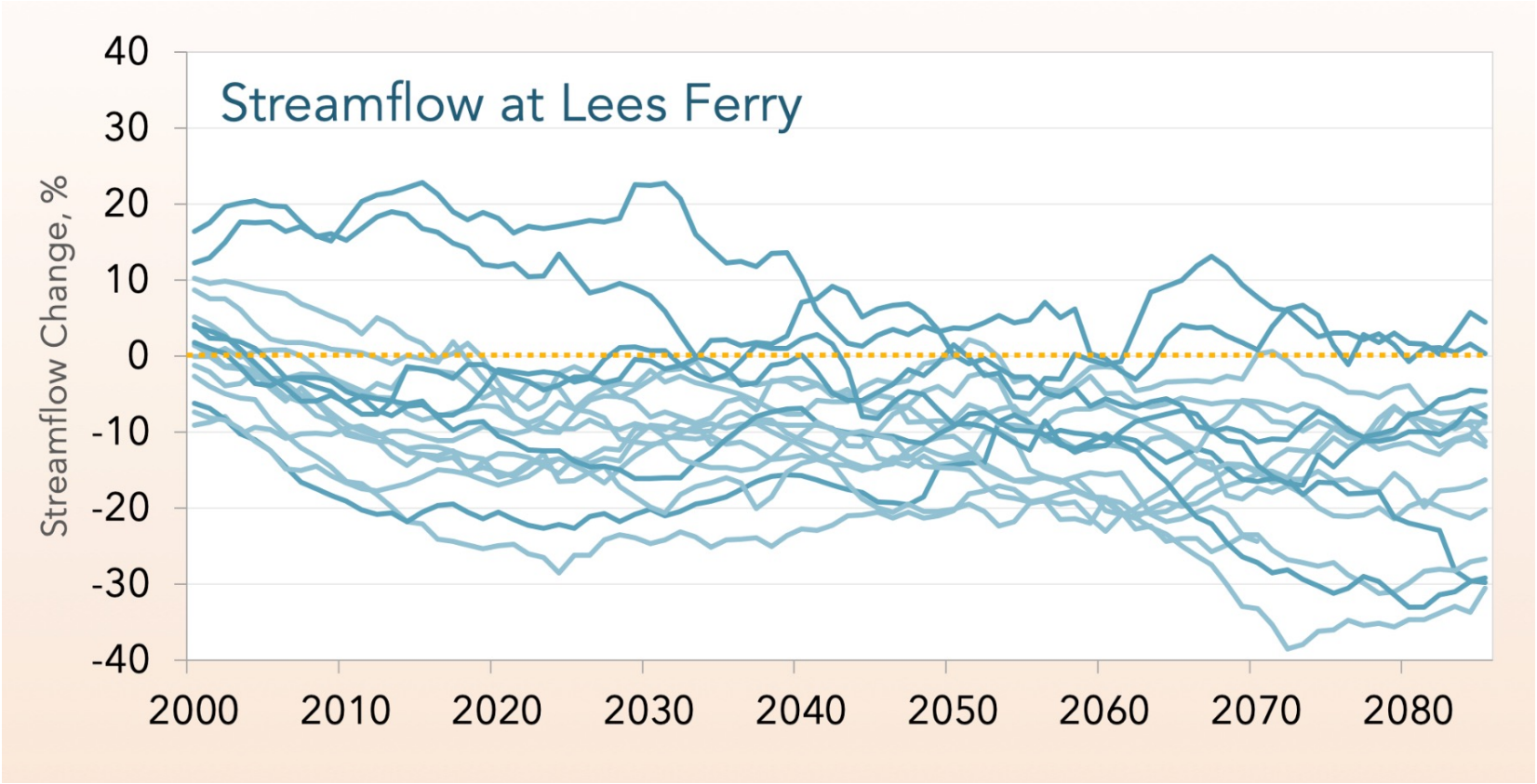
*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying **text summary** for forecast statements.*

NEW CLIMATE NORMALS





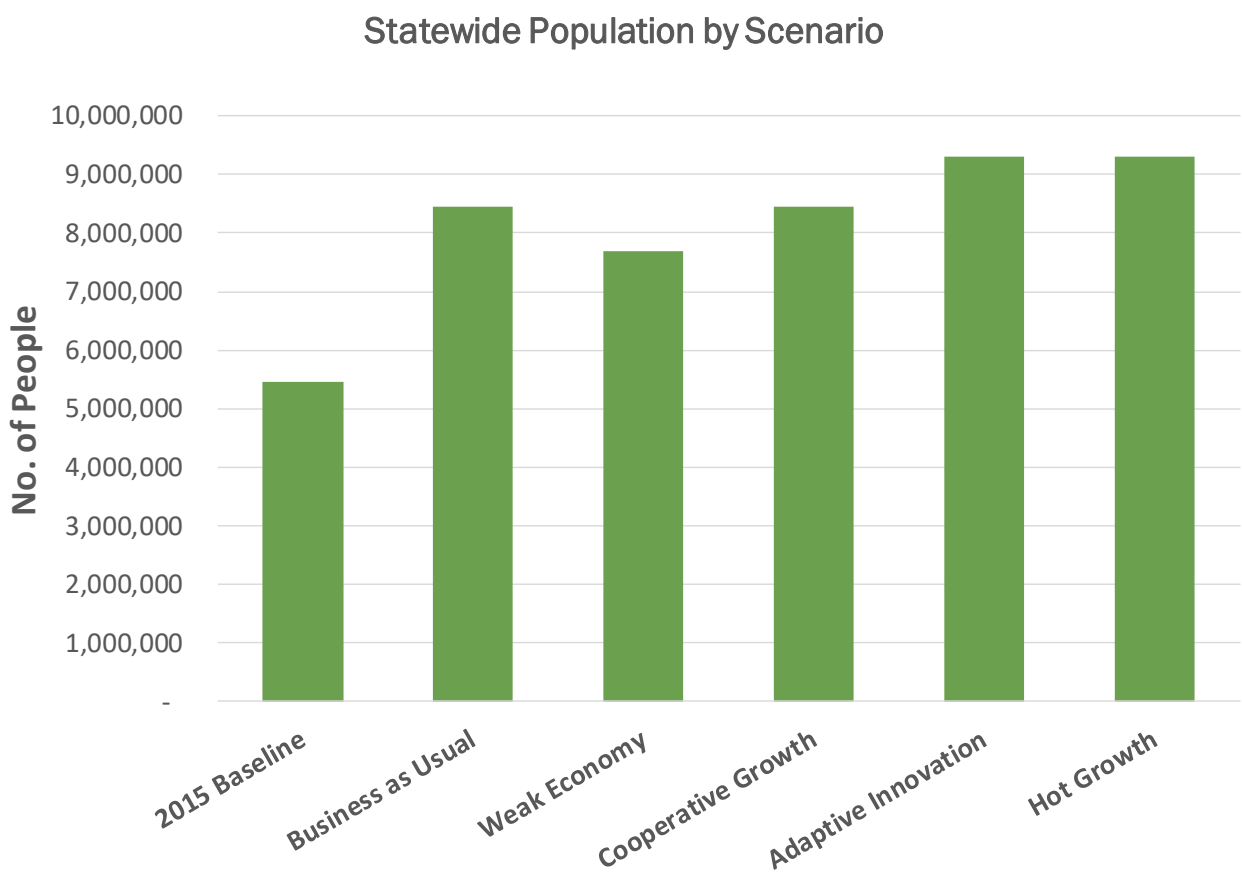
Future projections of Upper Colorado River Basin hydrology that assume small future changes in precipitation



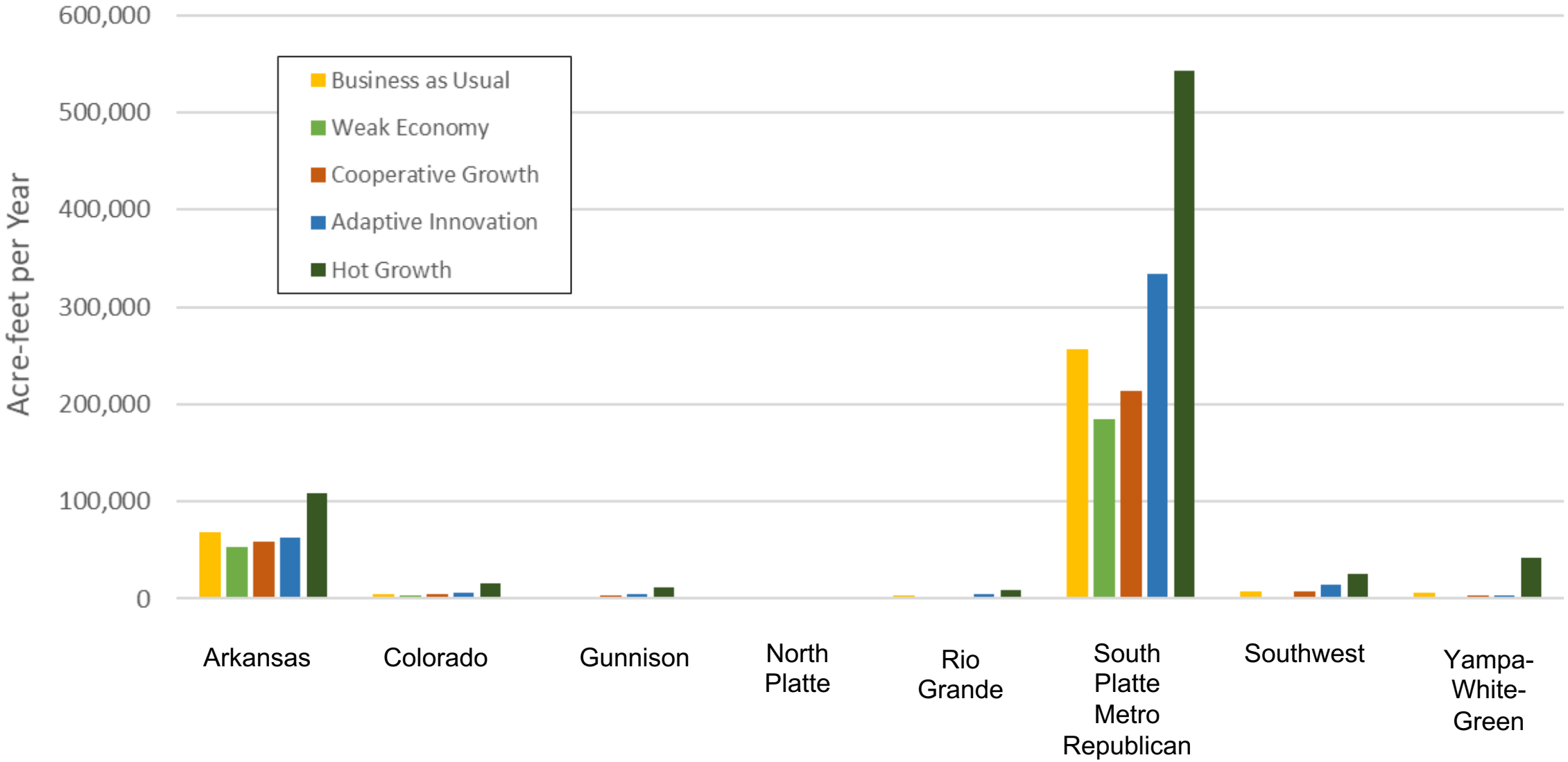
CMIP5-LOCA-VIC dataset, RCP8.5
(Reclamation, USACE, NCAR, et al.)

PROJECTED POPULATION GROWTH

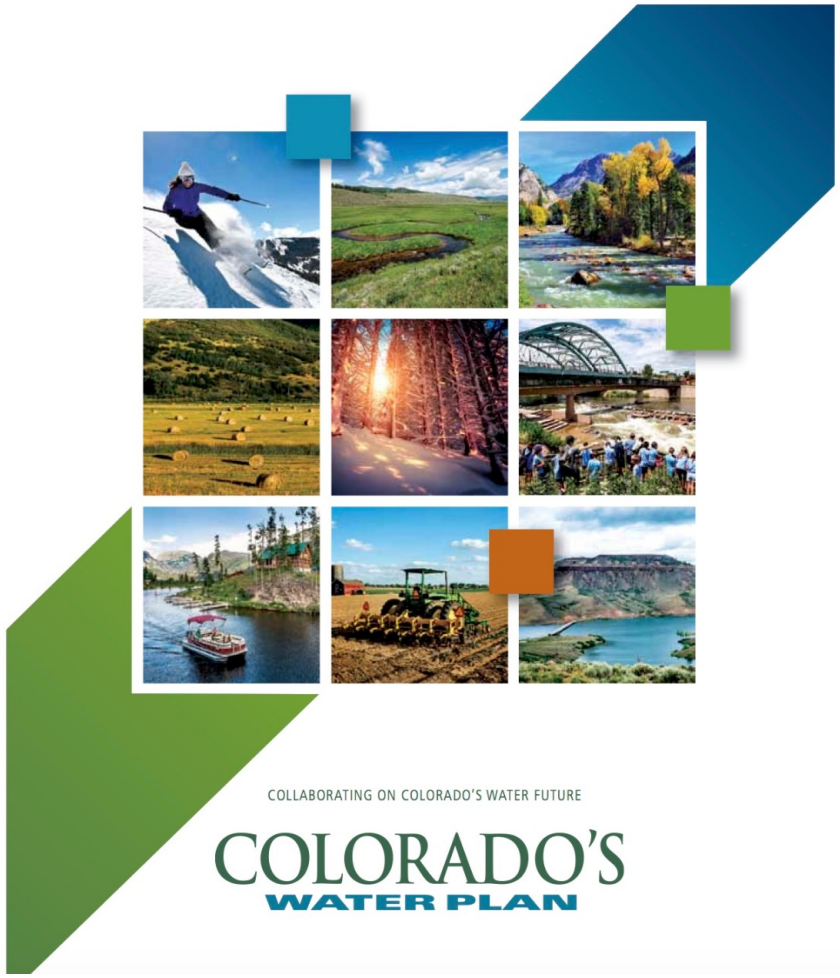
- 2020 US Census Population = 5.78M
- Estimated to grow to 8.5M by 2050
- Per capita water use has declined (5% between 2008-2015)
- M&I water demands projected to increase from 35 to 75% over current demands

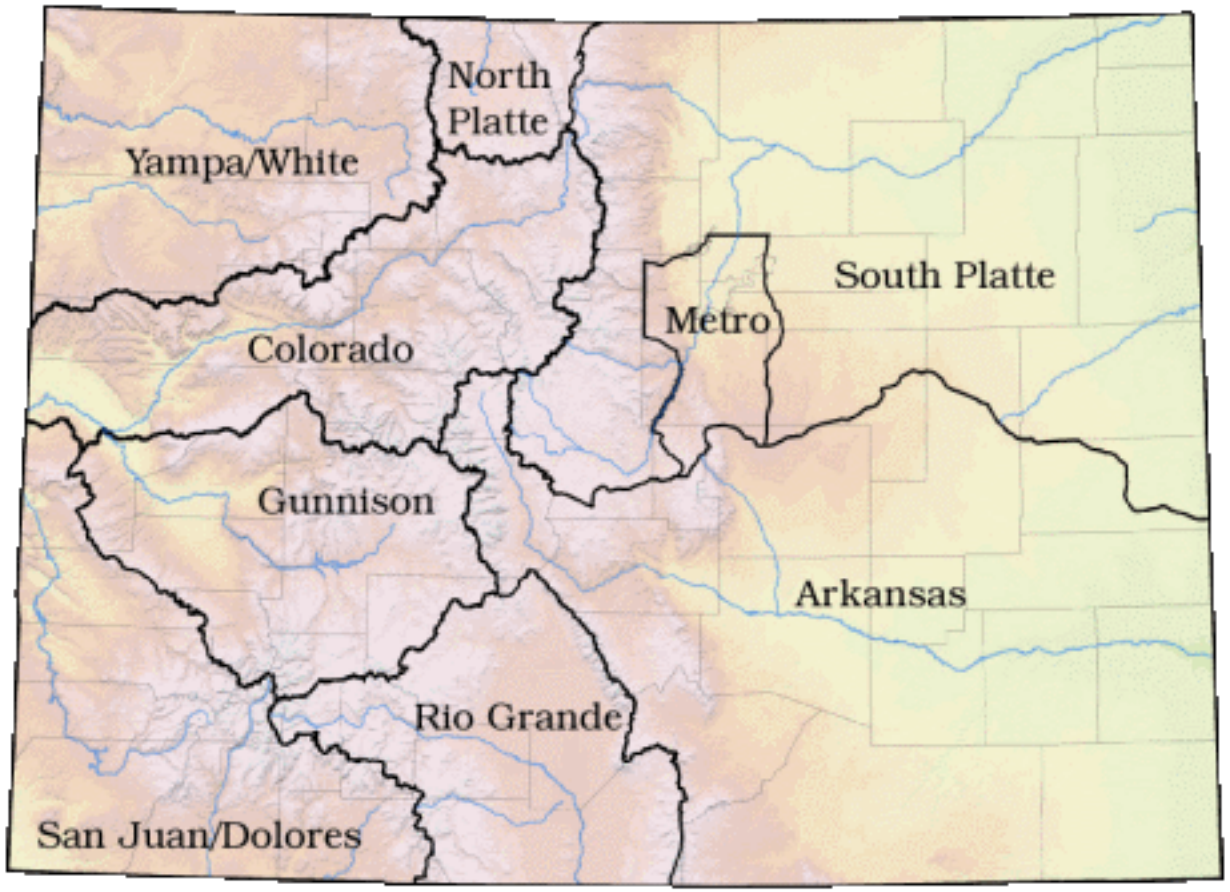


BASIN-SPECIFIC GAP ANALYSIS RESULTS – MAX M&I GAPS



COLORADO WATER PLAN





WATER PLAN GOALS

Supply-Demand Gap: Reducing the projected 2050 municipal and industrial gap from as much as 560,000 acre-feet to zero acre- feet by 2030.

Conservation: Achieve 400,000 acre-feet of municipal and industrial water conservation by 2050.

Land Use: By 2025, 75% of Coloradans will live in communities that have incorporated water-saving actions into land-use planning.

Agriculture Productivity: Keep pace with growing state, national, and global needs; 50,000 AF in Alternative Transfer Methods by 2030.

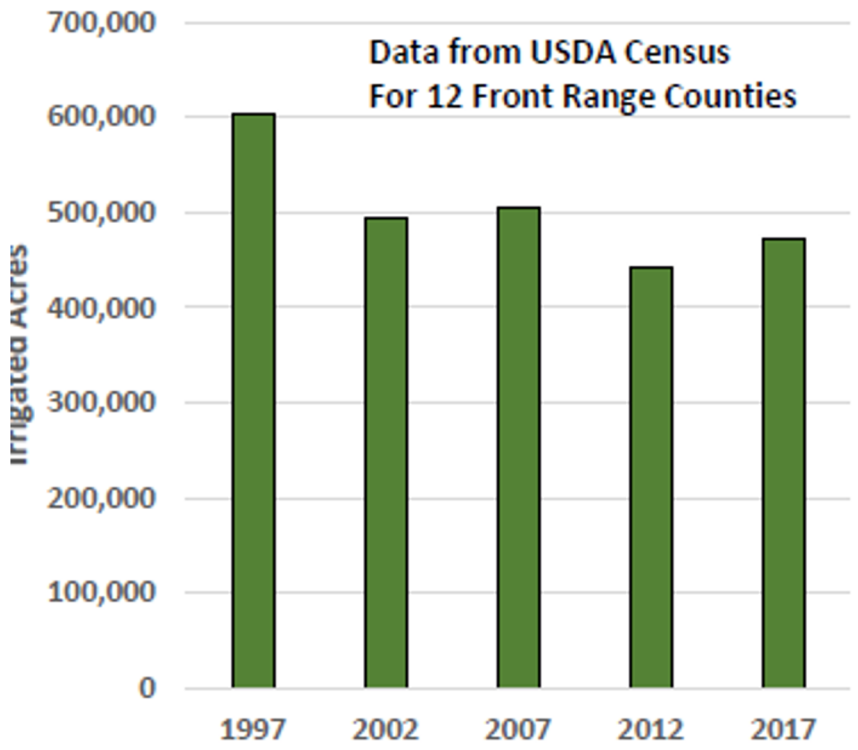
Irrigated Agriculture in Colorado

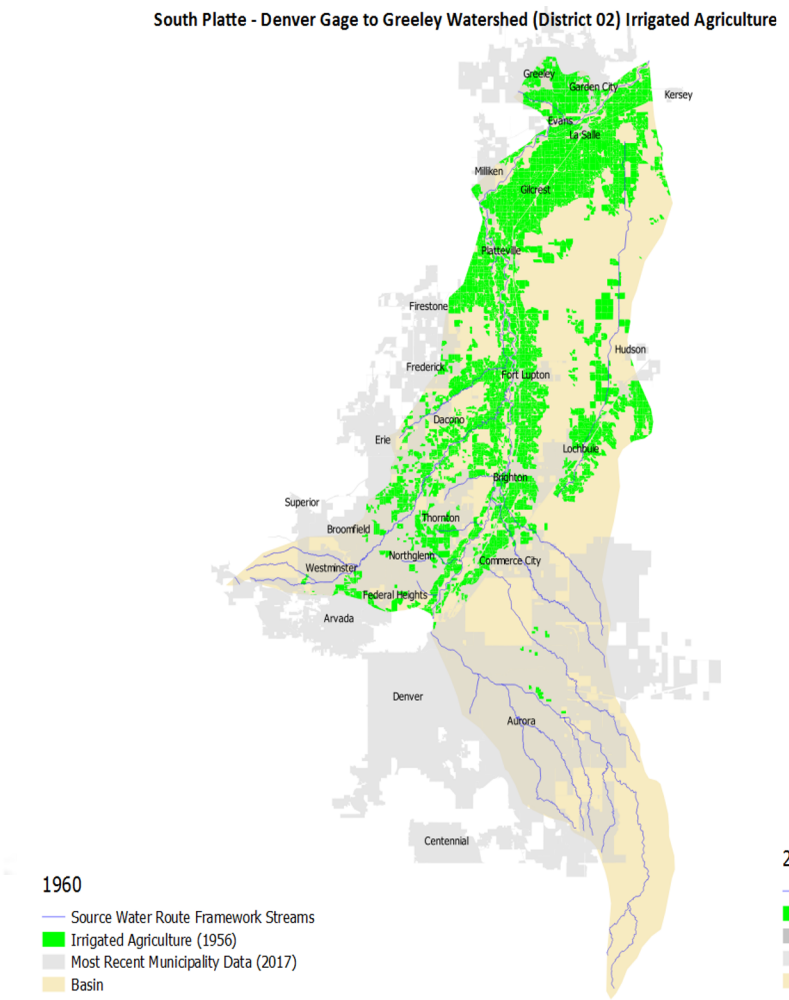
- State's agriculture industry is a critical driver of Colorado's overall economy, contributing $41 billion and 173,000 jobs (2013).
- Agriculture remains a critical economic multiplier in rural areas of Colorado
- Working lands sustain important ecosystem services including wildlife habitat, flood control, and carbon sequestration
- CSU Public Attitudes About Ag in Colorado (2016) report found significant support for protecting agricultural land and water for open space preservation

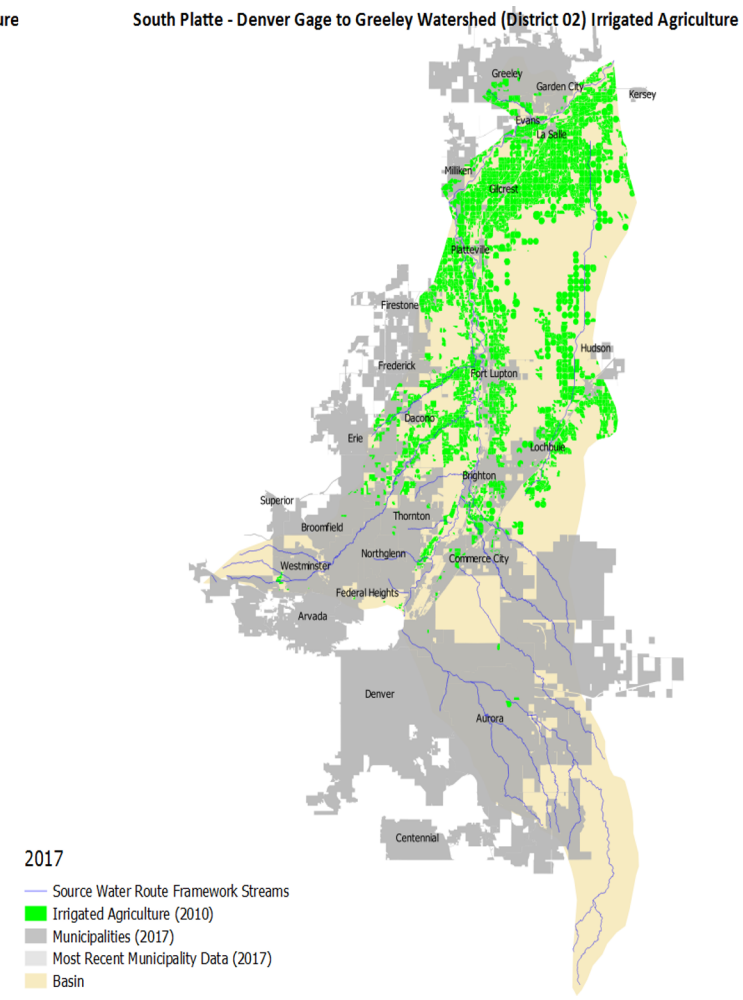
Crowley County, Colorado

- Once a key agricultural community, known for sugar processing, cantaloupe
- Increase in ag to urban water transfers begins in 1960s due to several factors such as debt, low commodity prices, drought, and buyers
- Purchase of irrigation water rights in Twin Lakes Reservoir and CO Canal and transferred to Aurora, Pueblo, and Colorado Springs
- 92% reduction in irrigated acreage in Crowley County (47,373 acres); significant loss of jobs and businesses; declining population; decline in local tax revenue for services

Decline in irrigated agricultural land in Colorado







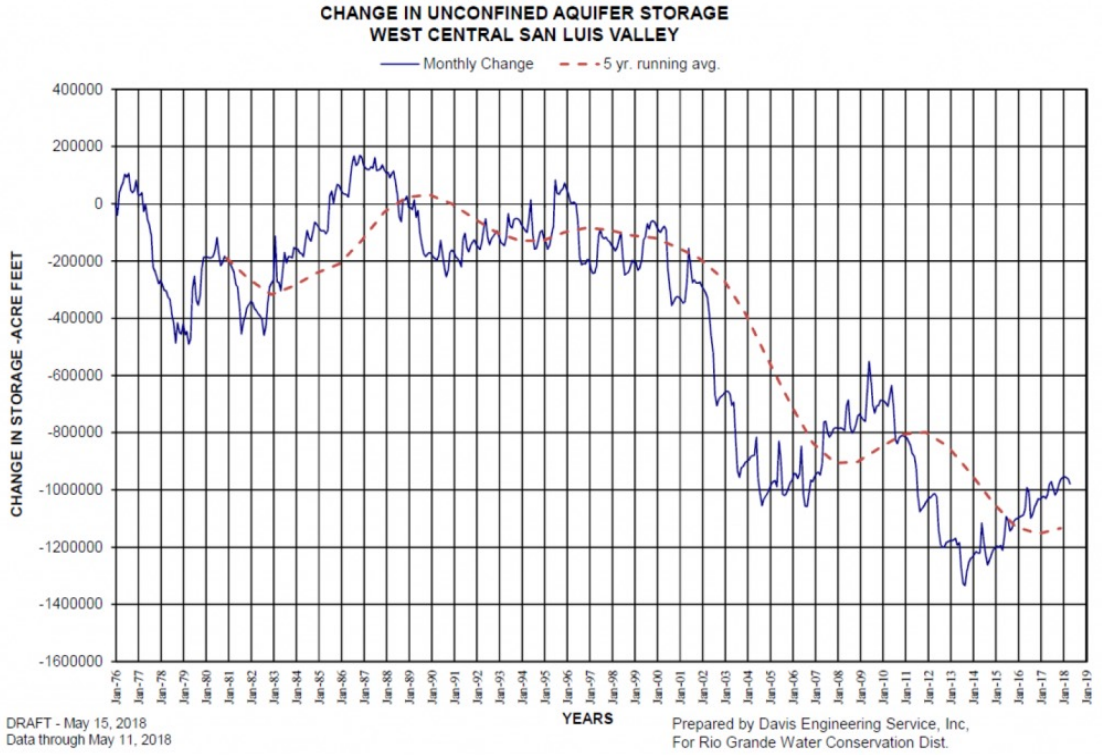
Source: Open Water Foundation

Trends

According to state projections, water supply and demand challenges will continue to drive potential, permanent reductions in irrigated agriculture acreage in most basins

What are the key water-related drivers:

- **Planned agriculture to urban transfers** = 77,600 acres (this could increase depending water supply development)
- **Urbanization** = 152,400 acres (5% of current acreage)
- **Groundwater sustainability** =
  - Rio Grande Basin upwards of 81,000 acre-reduction
  - Republican Basin upwards of 135,420 acre-reduction
  - 20% of groundwater irrigated production in South Platte Basin due to limited augmentation supply

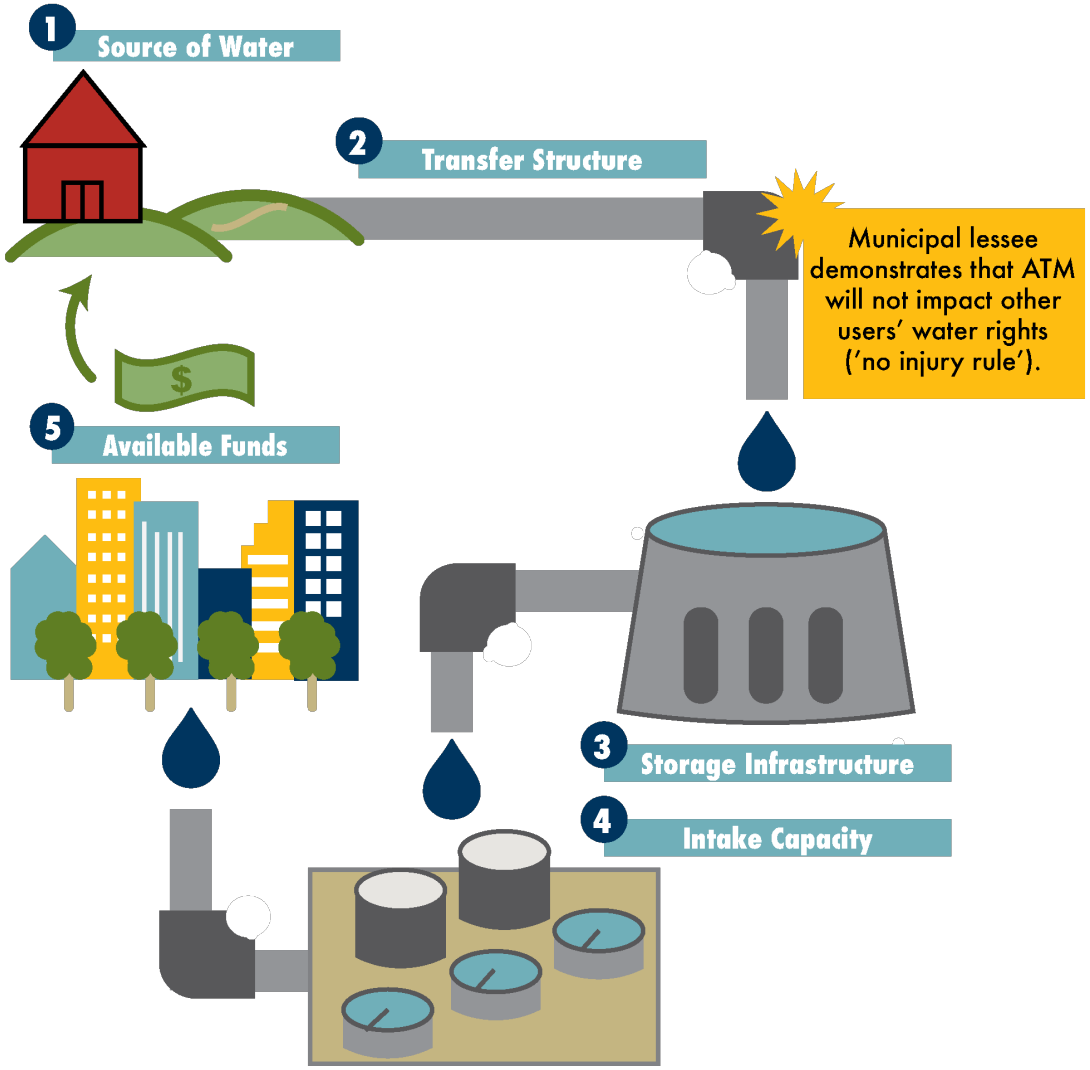


Are there alternative solutions?

Alternative Transfer Methods, or Water Sharing Agreements

- **Basic components of most ATMs:**
  - Traditionally an agricultural water user with historical consumptive use
  - An interested party (e.g. a municipal water providers) in a position to pay for the use of water for near or longer term purposes
  - Legal transfer structure and approval for the transfer, e.g. statutory, water court, and/or State Engineer processes
  - Appropriate infrastructure to store and deliver water
  - Agreed upon price for the transferred water

Necessary Conditions for ATMs



1. Municipal buyer identifies a willing agricultural water right owner to lease from.
2. Infrastructure extists to move water from lessor's point of diversion or ditch to municipality.
3. Storage infrastructure provides municipal lessee agility and flexibility of use.
4. The municipality (or its partner agencies) has the capacity to intake raw water supplies.
5. Flexible funding is available for innovative water supply projects.

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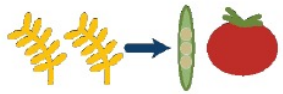
SOURCES OF WATER

ATM agreements require agricultural water users to temporarily reduce their use to free up water for transfer. Strategies for doing this include, but are not limited to:

TEMPORARY FALLOWING

ROTATIONAL FALLOWING

CROP SWITCHING



DEFICIT IRRIGATION

Efficiency improvements don't generate transferable water in Colorado! (most of the time)

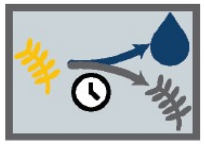
TRANSFER STRUCTURES

ATM agreements require a legal structure to govern the exchange of water between participating parties. These are contractual agreements, laying out how and when the water is shared, and can take various forms:

LEASE AGREEMENTS

SUBSTITUTE WATER SUPPLY PLANS

PURCHASE-AND-LEASE BACK



WATER BANKS

INTERRUPTIBLE WATER SUPPLY AGREEMENTS (IWSAS)

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ATMS VS. BUY AND DRY

ATMs are an alternative to “buy and dry” transactions and offer the following benefits over the permanent transfer of water away from agriculture:

PRESERVE OPEN SPACE

ATMs can protect Colorado’s open landscapes and wildlife habitat.

MAINTAIN REGIONAL ECONOMIES

ATMs protect farmers and the numerous jobs and industries that depend on them.

ACCESS TO LOCAL FOOD

ATMs support continued local agricultural production providing access to local food.

COMMUNITY BUFFER ZONES

ATMs support Coloradans’ interest in keeping agricultural land between neighboring communities.

ENVIRONMENTAL PRESERVATION

By keeping farmland in production, ATMs prevent environmental impacts such as non-native weeds, lack of pollinators, and erosion.

MAKE AGRICULTURE FINANCIALLY VIABLE

ATMs can provide critical financial support to local farmers to upgrade systems and equipment and to provide revenue during drought.

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ALTERNATIVE TRANSFER METHODS

FLEXIBLE & INNOVATIVE WATER SUPPLY ALTERNATIVES

A GUIDE FOR LOCAL LEADERS IN COLORADO

waternow alliance

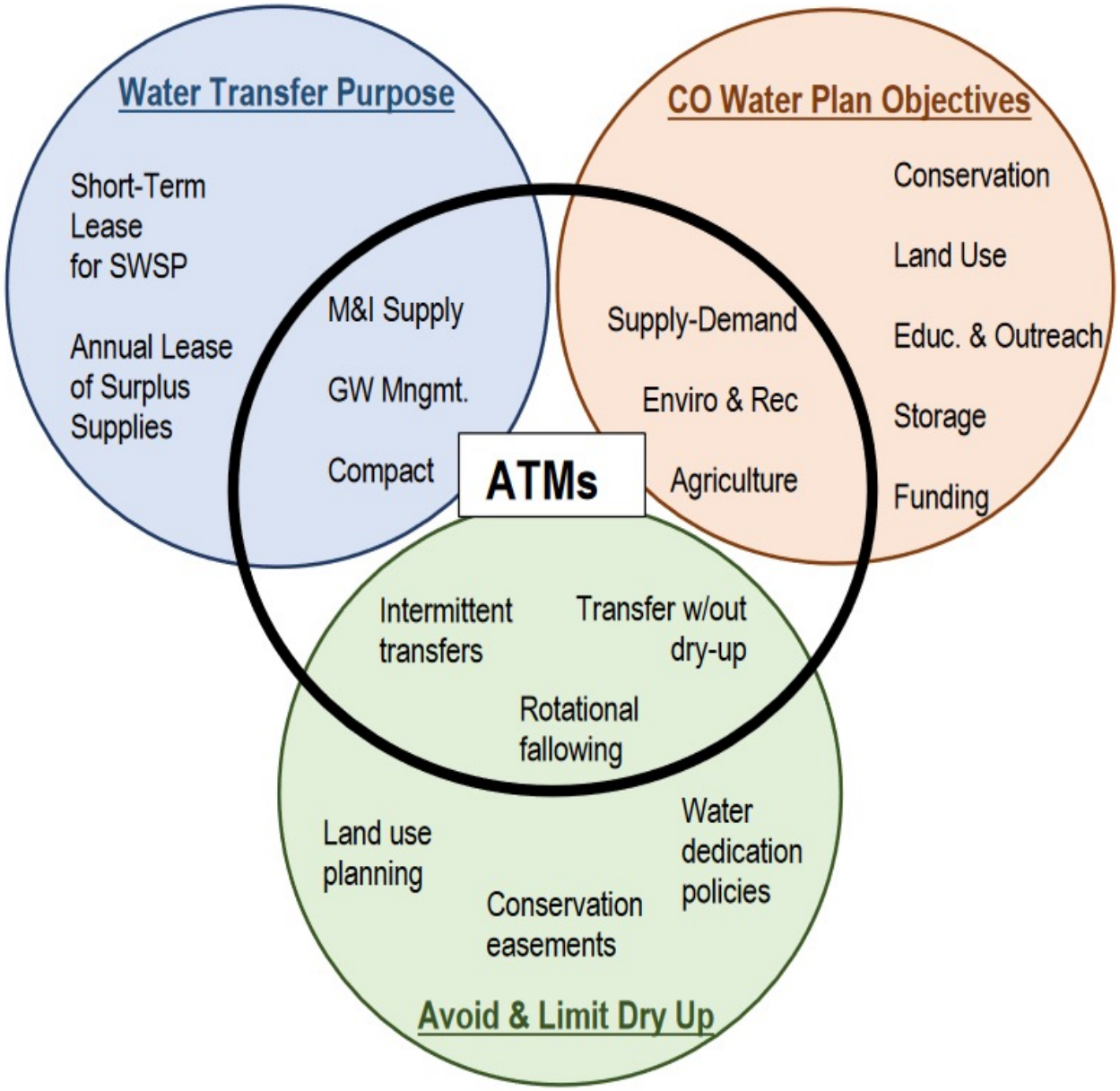
Available at:

waternow.org/project/colorado-atms

2020 ATM Status Report: Where are we going next?

- **Delivery and infrastructure cost** – regional and cooperative approaches to infrastructure development and funding
- **Complex process, high transactions costs for temporary supply –** work to encourage administrative processes to streamline certain types of transactions for drought recovery
- **Permanency and risk –** transaction needs to pencil out for all parties- promising models may include coupling of conservation easements with ATM or co-ownership of water supply or land
- **Agronomic benefits and impacts –** additional research and demonstration to understand temporary fallowing and impacts to crop yield, recovery, and soil health
- **Encouraging flexibility –** recognizing alternative water-sharing approaches such as municipal rental programs

Conceptual Elements of Defining an ATM



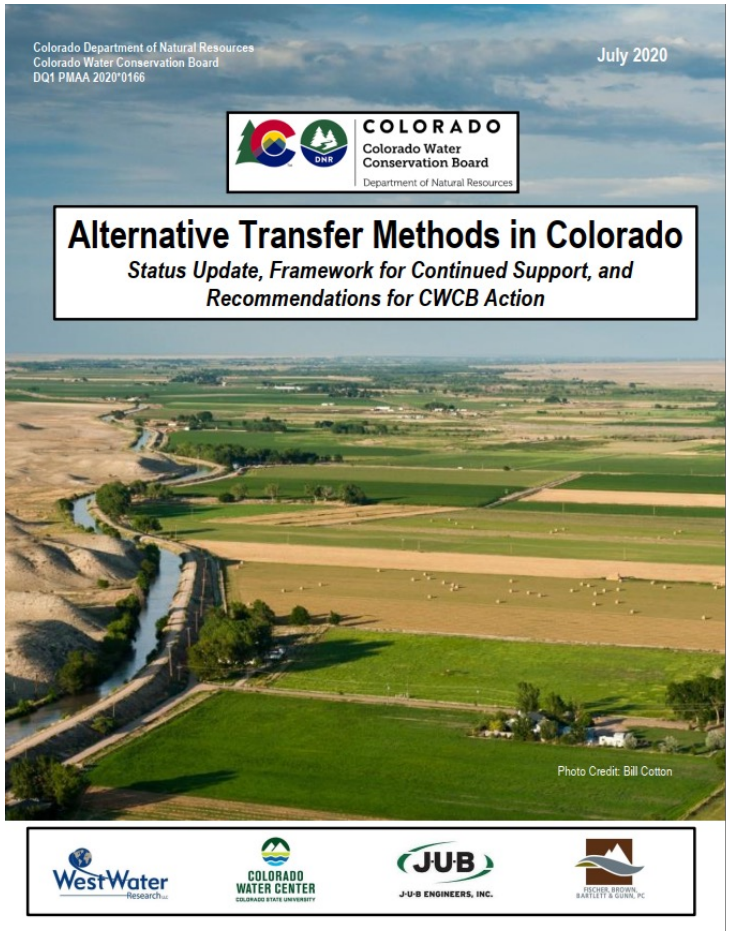
Innovative Water Supply Solutions

May 11, 2021

Brett Bovee
WestWater Research, LLC
Fort Collins, CO

Photo: Poudre River, NPS

ATM Status Report (July 2020)



1. How to Improve Use of ATMs

2. What Other Actions Besides ATMs

https://cwcb.colorado.gov/focus-areas/supply/alternative-transfer-methods

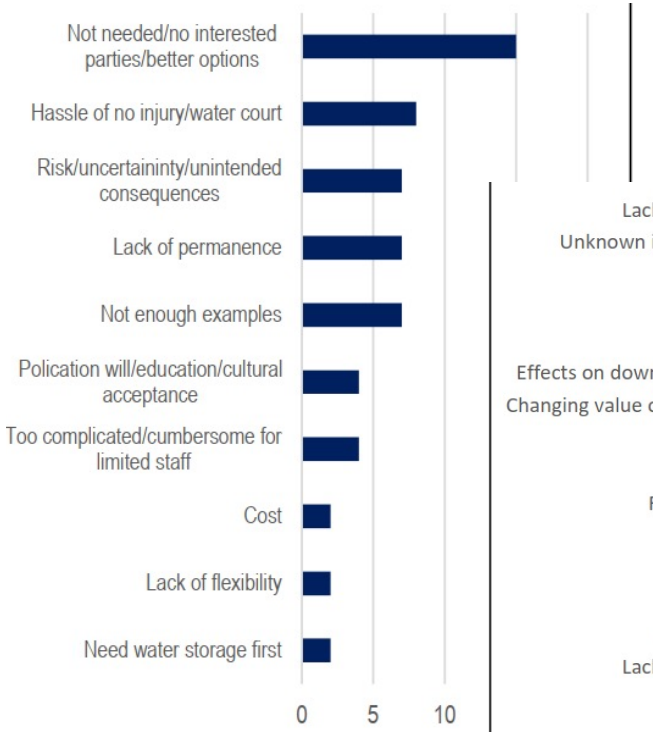
How to Improve Use of ATMs

Photo: South Platte River, USGS

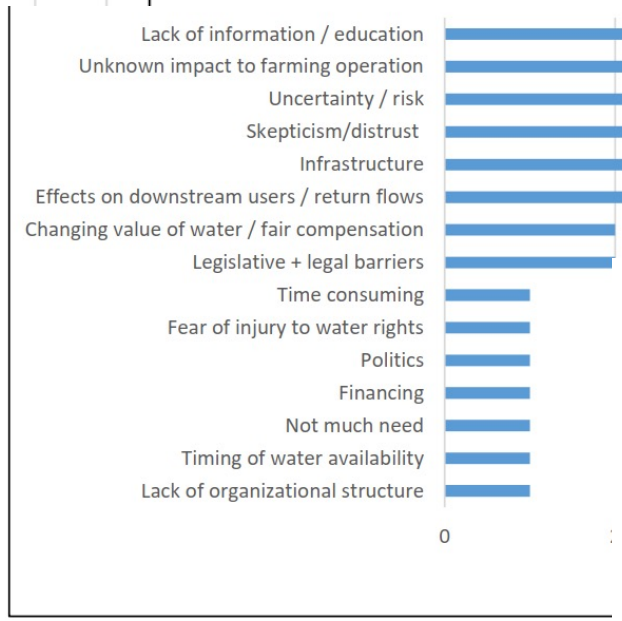
Lots of Barriers to ATM Use

ATMs are not an obvious choice to solve municipal water supply challenges

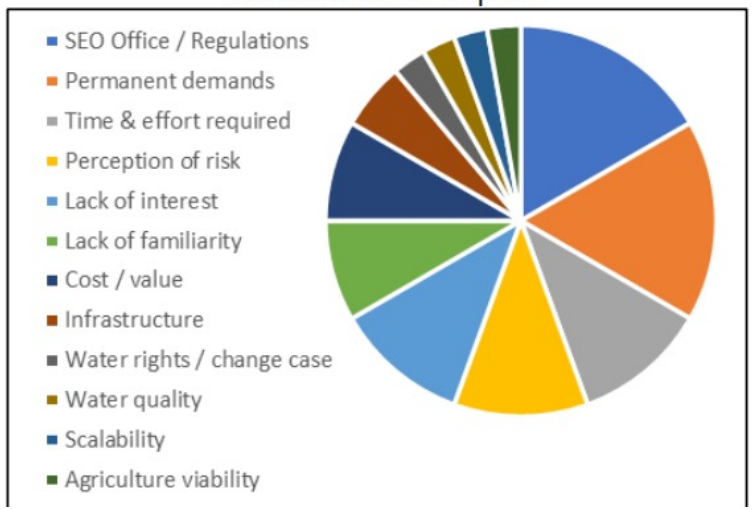
From Municipal Water Managers



From Basin Roundtables



From Past Participants



How to Improve Use of ATMs

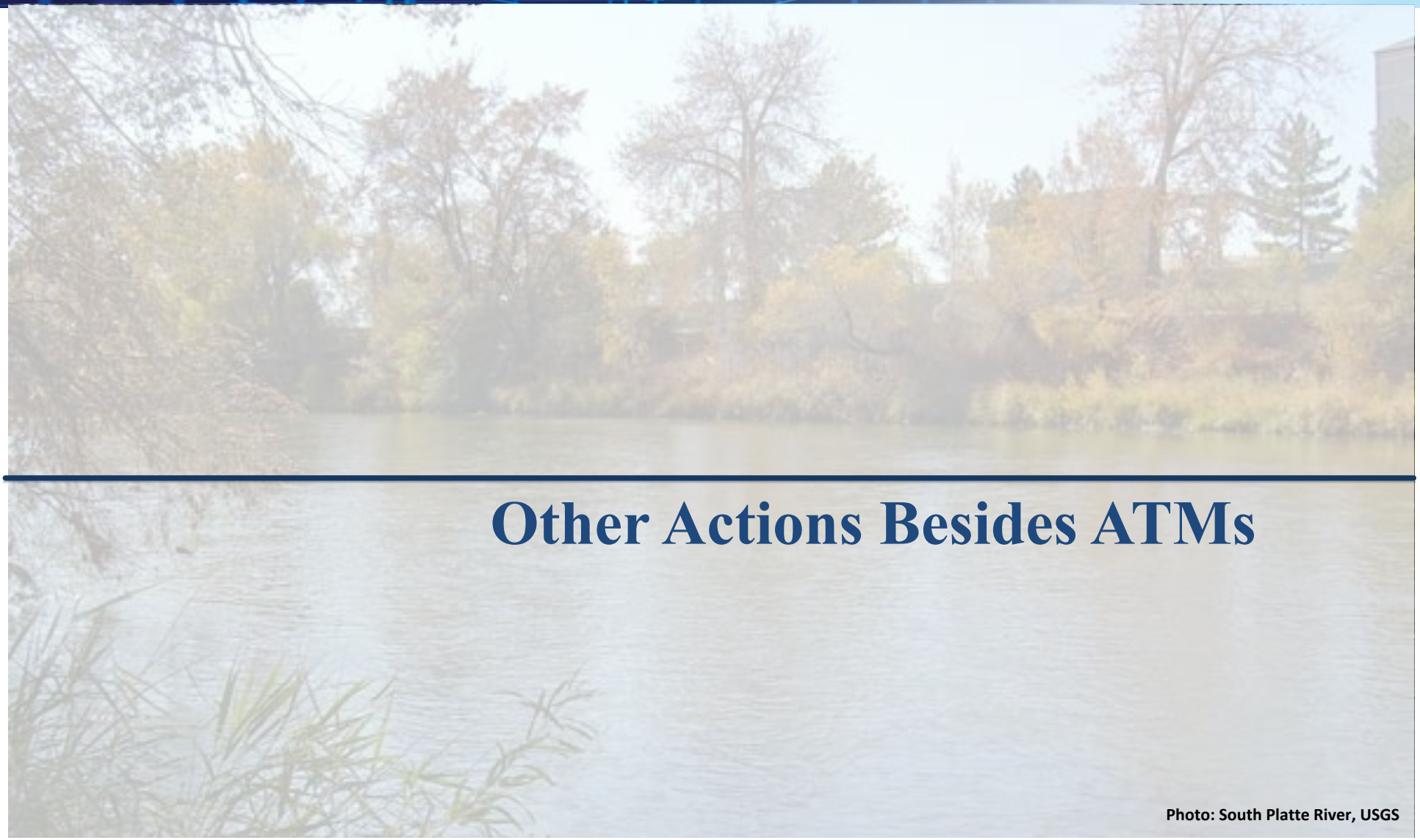
1. **Maintain Grant Program.** CWCB has provided roughly $7M in grants to help study and implement ATMs since 2007. This program provides critical funding to develop early-stage projects.

2. **Incentivize ATM Consideration**. CWCB could adjust its grant funding policies and low-interest loan rates for water projects to consider ATM solutions at an early planning stage.

3. **Reduce Regulatory Uncertainty & Cost**. Adopt presumptive factors to apply instead of costly engineering studies. Encourage flexible dry-up policies. Minimize impact on "historical use" metrics.

4. **Greater State Agency Coordination.** Common policies between CWCB and CDWR.

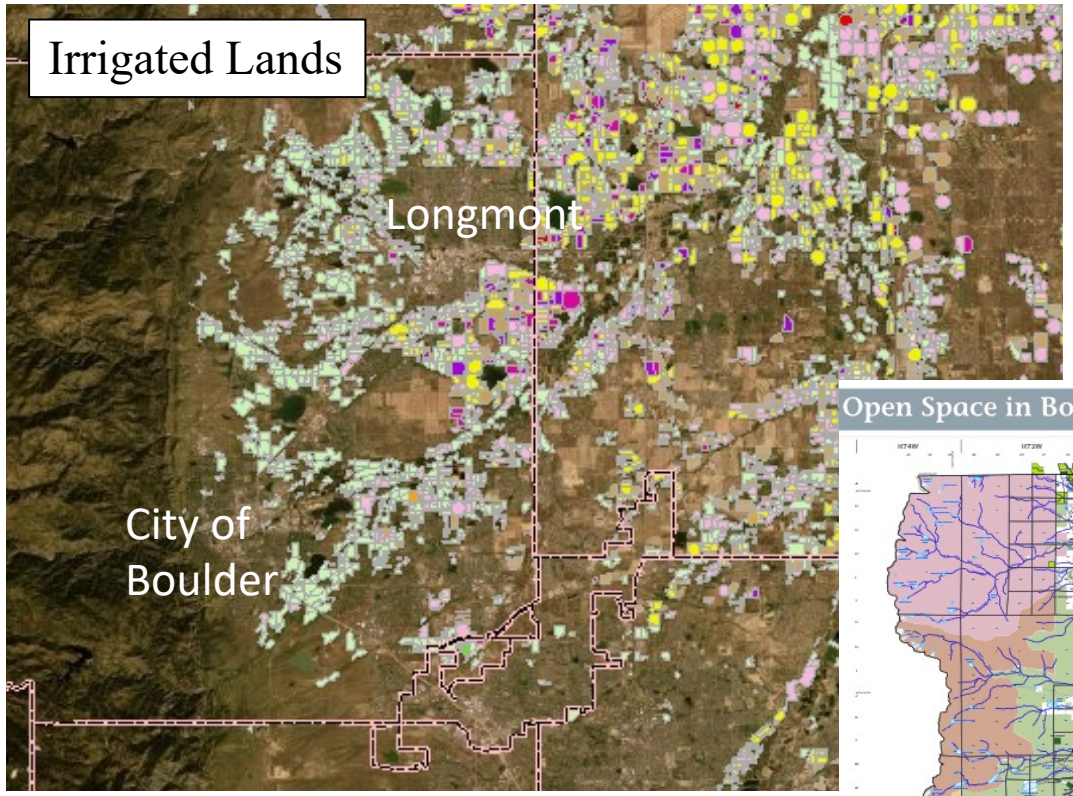
5. **Education & Outreach.** ATM website. Local facilitators to get interest and projects developed. Resources for municipal leaders. Development of local goals.



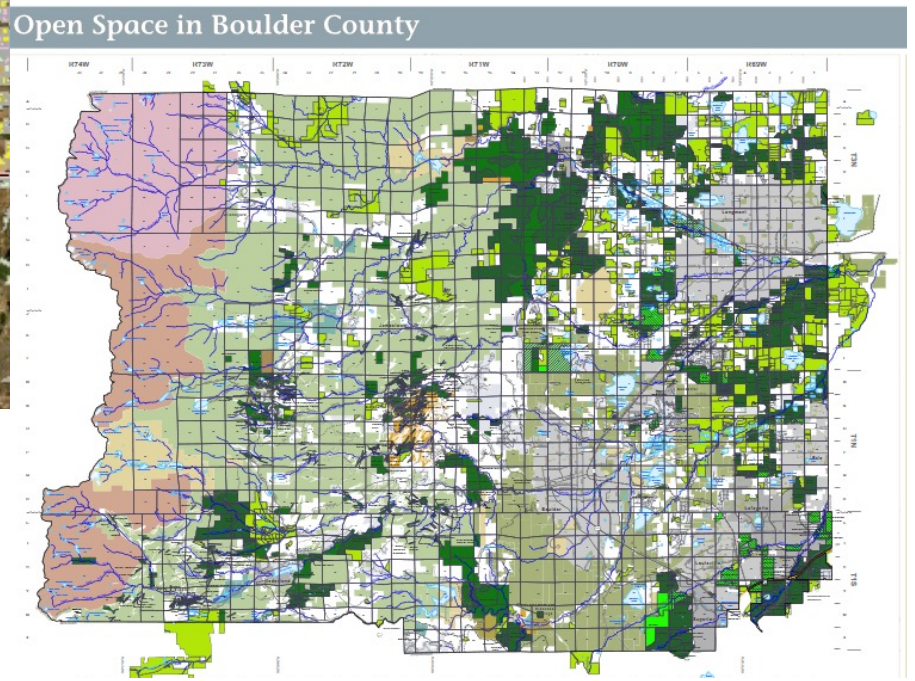
Other Actions Besides ATMs

Photo: South Platte River, USGS

Conservation Easements / County Planning



Boulder County Example

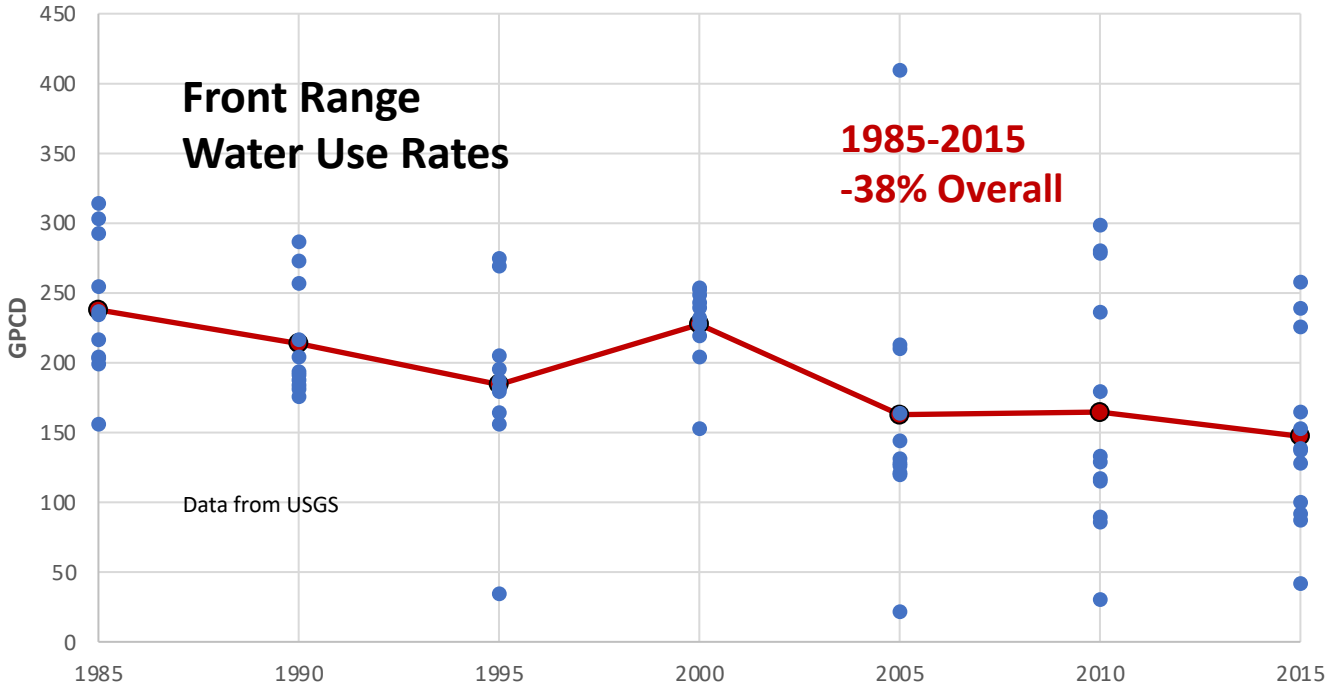


Change Municipal Water Dedication Policies

- Municipal water conservation has been successful
- Dedication policies often require more water than will be used in typical year
- Water right dedications must meet full demand of new development
- Changing policy will likely add risk relative to status quo

1. Reduce water right volumes required by new development & require new developments to be low water use

2. Transition to Cash-in-Lieu policies so that existing supply can be used & innovative supplies can be developed

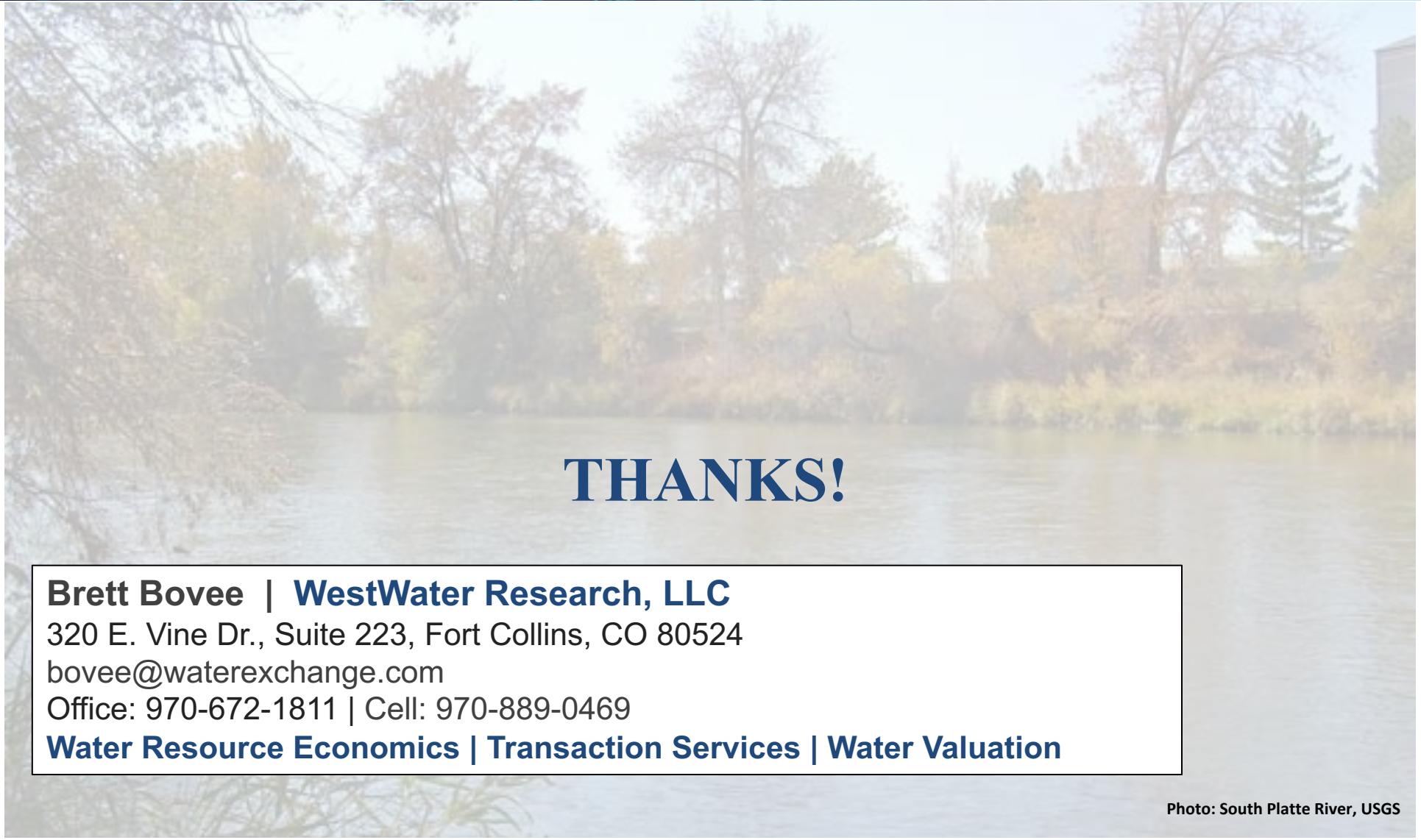


Long-Term Lease Backs: Municipal → Agricultural

- Most municipalities build portfolios to serve extreme droughts (1 in 50 yrs)
- Most municipalities have leasing arrangements to keep water in agriculture before the water is transferred to municipal use
- Most municipalities do not seek a "dual use" when water rights are changed to municipal use in water court → therefore restricted from lease-backs

- Greater consideration of long-term leases for:
  - Flexible types of water supplies
  - Water court decrees allowing "dual use"
  - Average to wet water supply years

- **Results in extra costs & regulatory headache for municipality**
- **Not embraced by agricultural sector because it forces short-term planning**



THANKS!

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Water Resource Economics | Transaction Services | Water Valuation

Photo: South Platte River, USGS

City of Thornton's Northern Properties Stewardship Plan

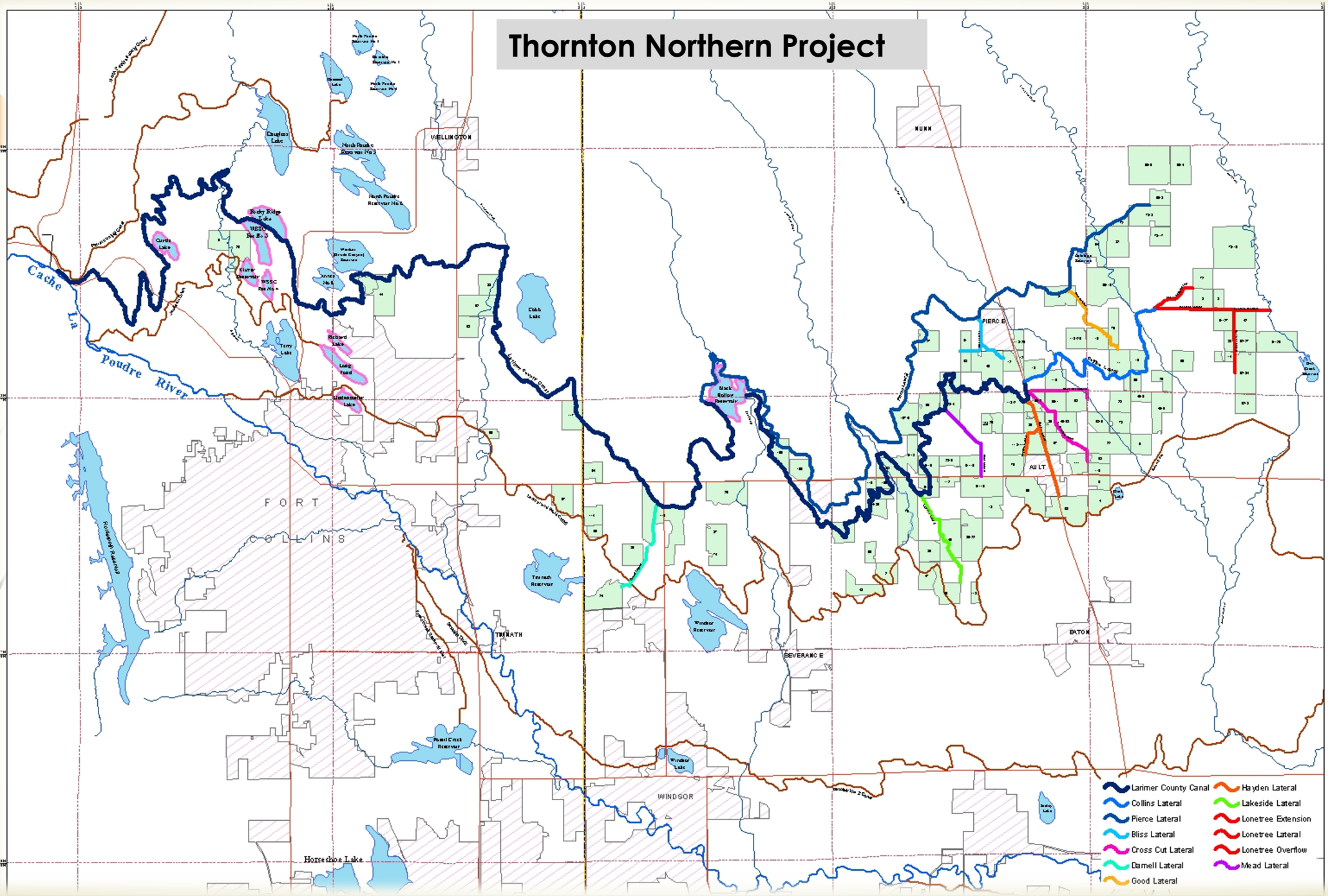
Colorado Municipal League – WaterNow Solutions to Water & Growth Challenges Part I

May 11, 2021

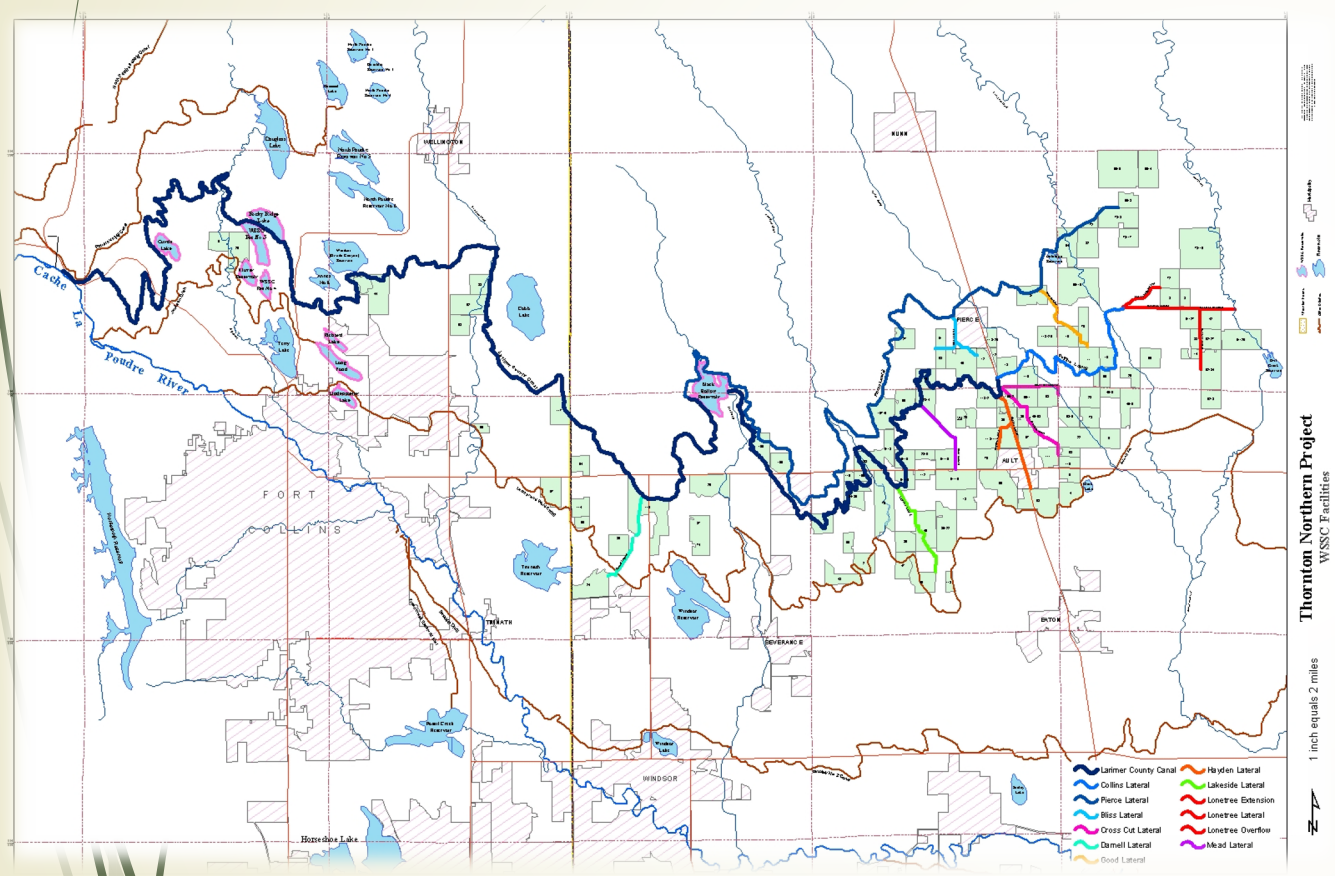
Emily Hunt, Deputy Infrastructure Director

City of Thornton

Thornton Northern Project



Thornton Northern Project



1985 to 1987
Acquisition

- Acquired 110 farms, ~21,000 acres
- 284 shares of Water Supply and Storage Company (WSSC)
- Farmhouses, wells, and other assets

1985 to present
Property Stewardship

- Continued irrigated agriculture
- Gradual conversion to self-sustaining and native grasses began in 2000s

1986 to 1998
Water Court

- Change of use from agricultural to municipal
- Junior direct and exchange rights

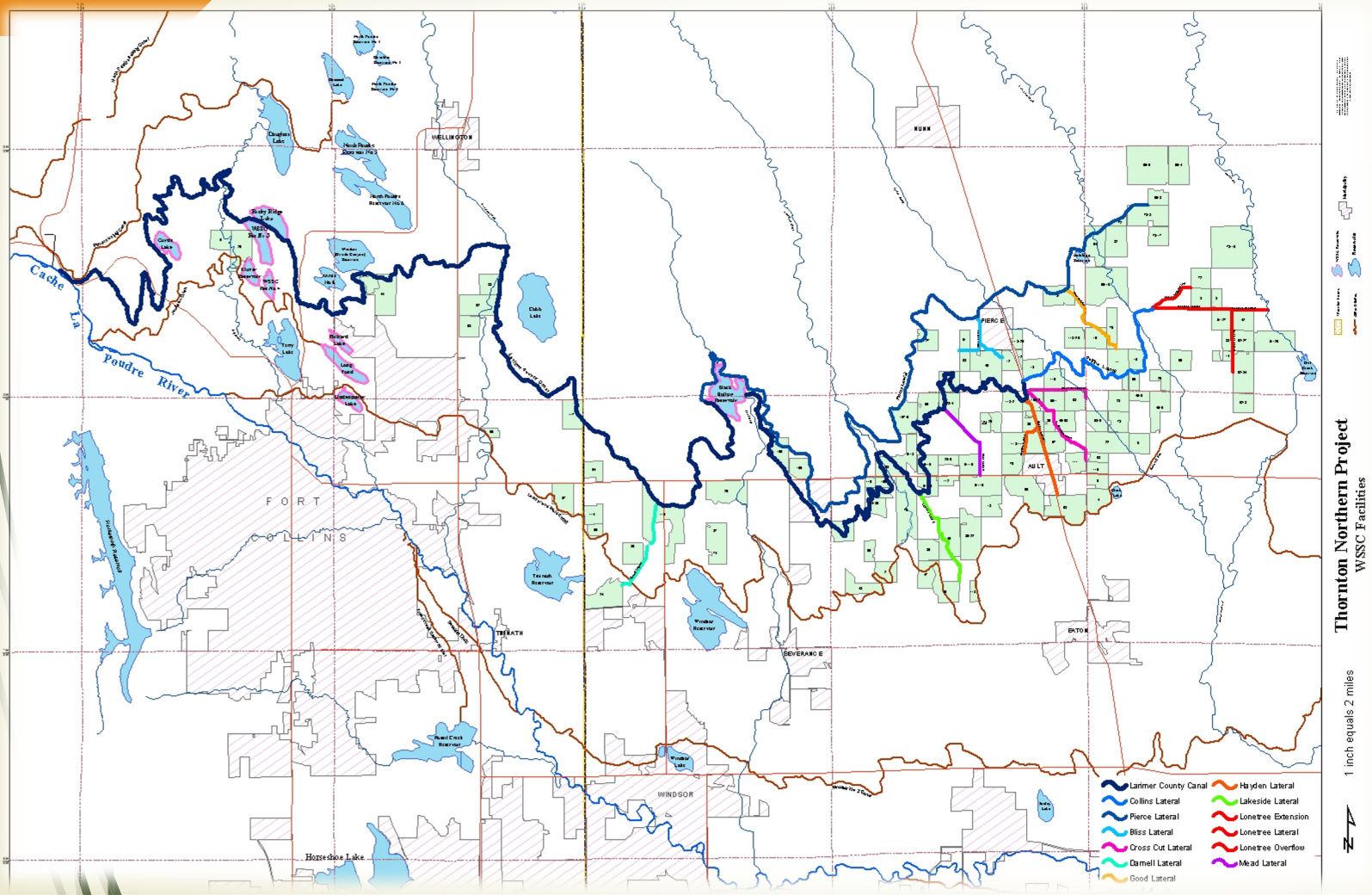
2014 to present
Thornton Water Project

- Pipeline/conveyance infrastructure
- Phased water delivery beginning in 2025

2018 to present
Northern Properties Stewardship Plan

- Data-driven and community-informed property management and long-term land use planning

Thornton Northern Project – Three Components



Northern Project Water Court Decree:
Legally binding, addresses water rights injury and revegetation associated with agricultural to municipal conversion of Thornton's Water Supply and Storage Company (WSSC) shares

Thornton Water Project:
Regulatory processes involving pipeline routing and construction

Northern Properties Stewardship Plan
Voluntary – community informed property management and divestiture

Thornton's Northern Property Stewardship Plan

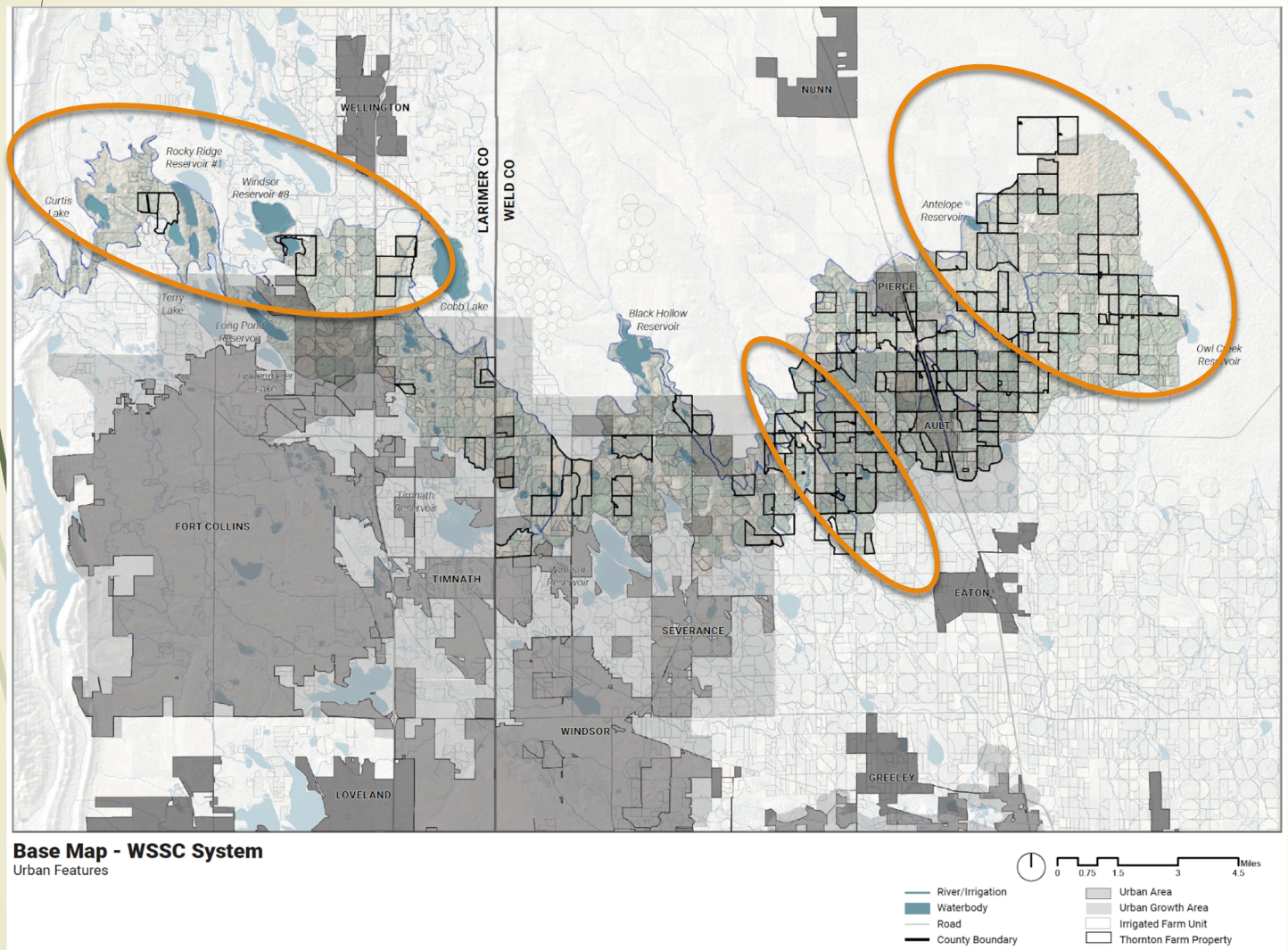
OBJECTIVE:
Thornton's Northern Properties Stewardship Plan is a **complementary process** to Thornton's agriculture-to-municipal water transfer.

While Thornton's **water will be used in accordance with Thornton's water rights decree**, the Stewardship Plan is a **vision for the management and future land** use of Thornton's 18,000 acres.

VISION:
Thornton aims to be an **engaged landowner**, respecting the needs and interests of the Northern Communities as it works to **secure its decreed water** rights.

Through a **community-informed** land use planning effort and a future-oriented lens, Thornton will seek the **highest and best land uses** for its properties and will work to **ensure a positive impact** for the Northern Communities.

Findings: Communities, Growth, Growth-Management Areas



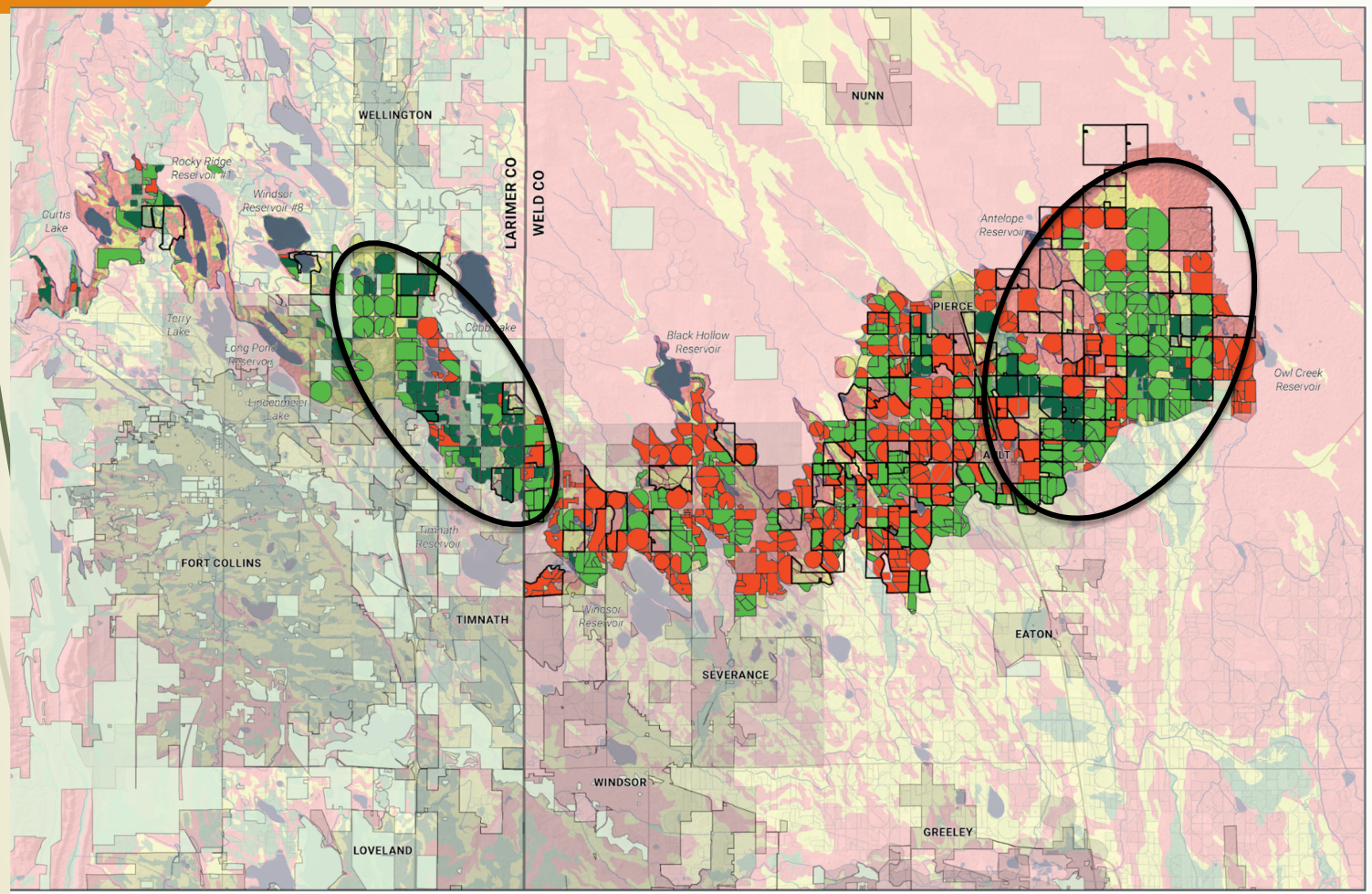
ABOUT THE MAP

- Municipal boundaries in dark gray.
- GMAs in light gray.

FOR CONSIDERATION

- WSSC occupies the northern boundary of concentrated growth areas in Larimer and Weld counties.
- 64% of the WSSC system lies in a GMA.
- Local growth is and will continue to be a driver of change on the WSSC system.
- Certain Thornton properties are suited to support residential, commercial, and industrial development objectives.
- The northwestern and northeastern portions of the WSSC system fall outside local GMAs, along with a thin sliver of land along the Coalbank Creek drainage corridor.

Findings: Irrigated Agriculture Preservation



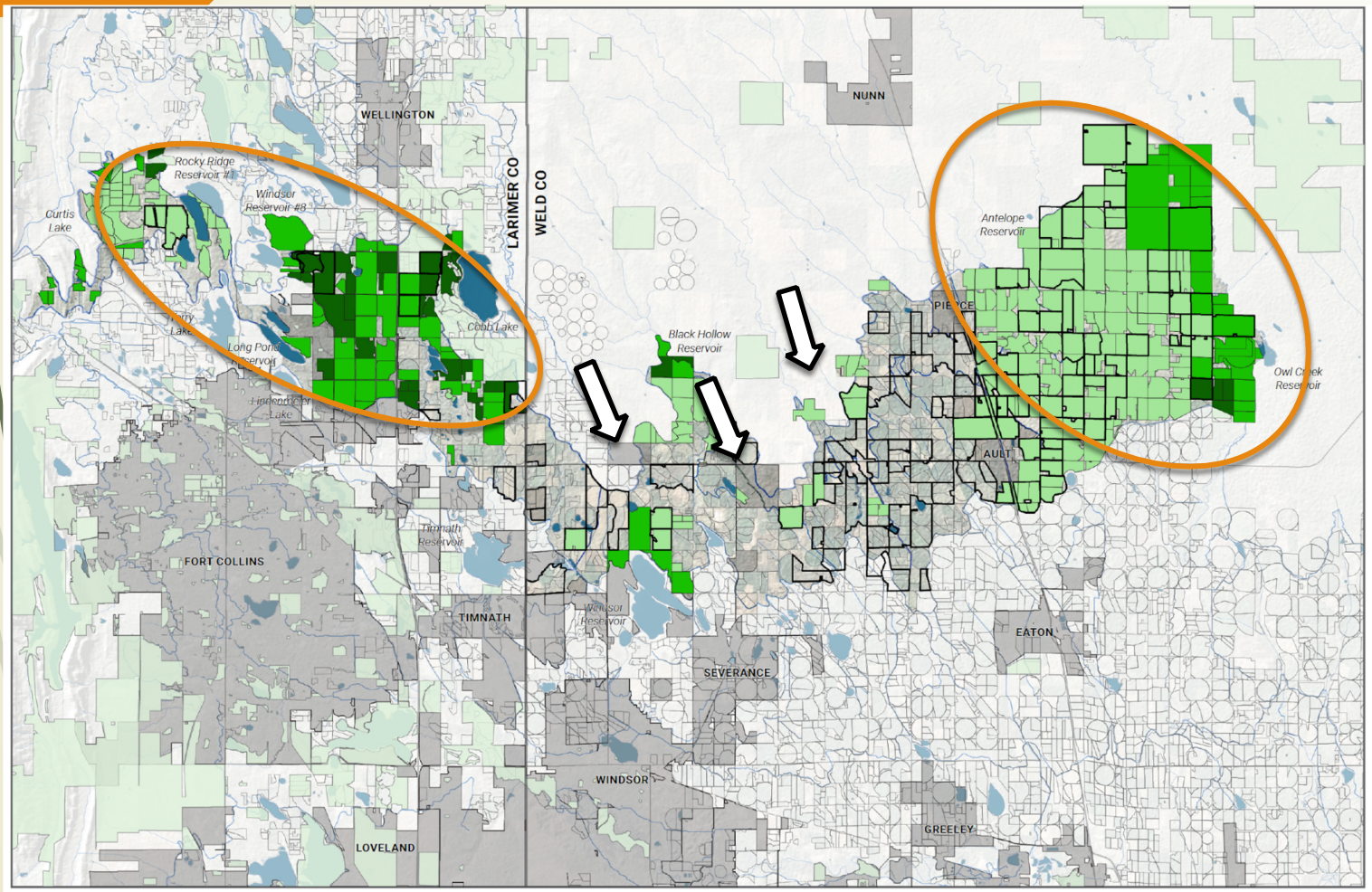
ABOUT THE MAP

- Prime farmland in green.
- Prime farmland with class 1 & 2 soils in dark green.
- Other classifications (not prime or prime only if certain conditions are met) in red.
- Background colors: green=class 1 soils; yellow=class 2 soils; red=class 3-8 soils

FOR CONSIDERATION

- White ovals: potential ag-land preservation priority areas?
- What opportunities exist to make use of Thornton's continued-irrigation provision to optimize future delivery of limited WSSC/non-WSSC water supplies to the best farm ground?

Findings: Conservation Opportunities & Land Use Transition Areas



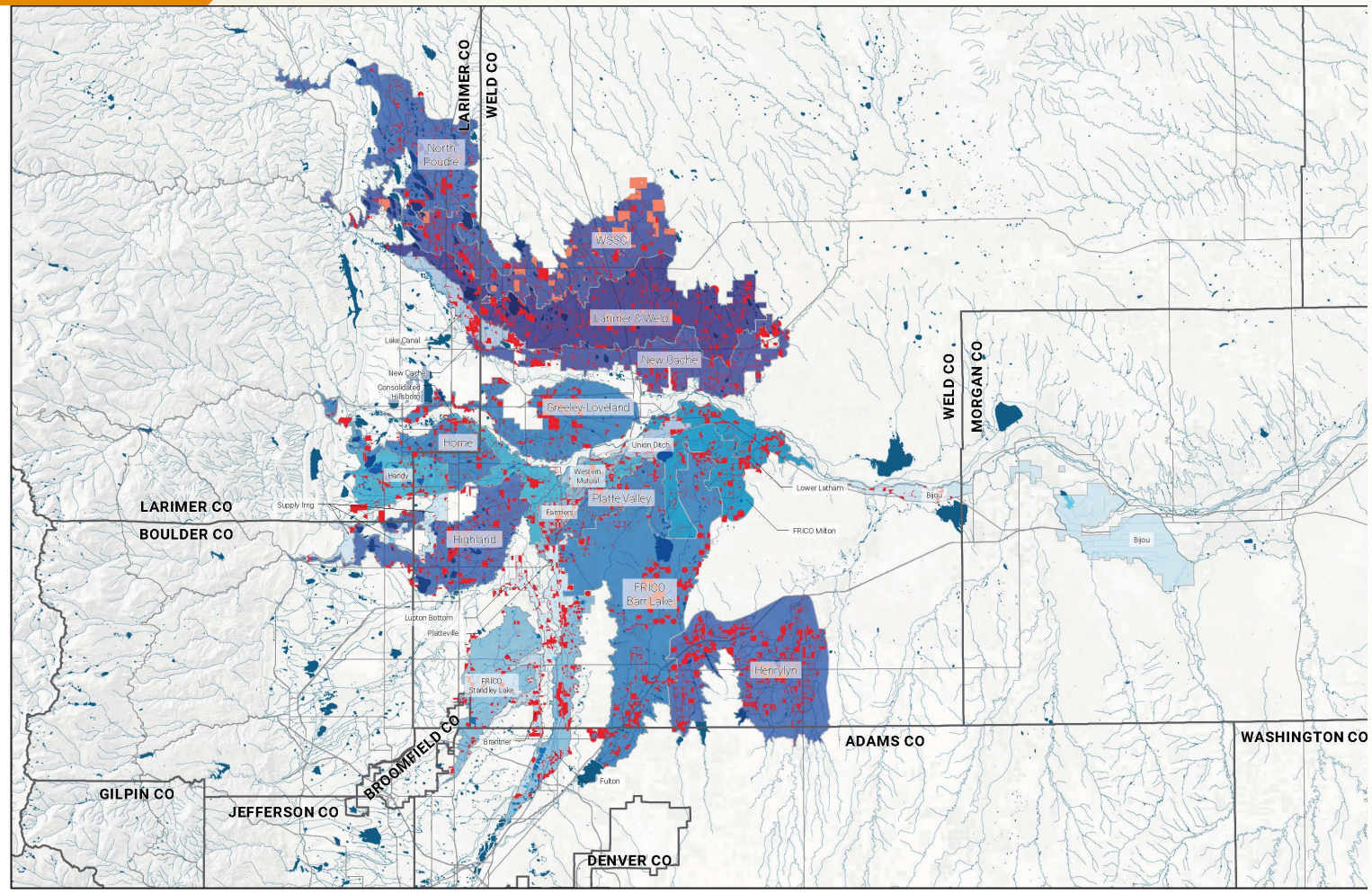
ABOUT THE MAP

- Composite analysis that considers:
  - protected lands
  - Potential Conservation Areas
  - Network Conservation Areas
  - LDI data that identifies areas of limited landscape disturbance.

FOR CONSIDERATION

- Large-scale conservation to support land protection and land use continuity across northeast and northwest priority areas?
- Smaller-scale conservation to create connectivity, deliver green infrastructure, provide community open spaces and growth buffers across the central portion of the WSSC system?

Findings: Agricultural-to-Municipal Water Transfers & Dry-up



ABOUT THE MAP

- The 24 of 194 ditches in Larimer and Weld counties that irrigate 2,500+ acres.
- Darker colors = greater irrigated acreage.
- Red estimates permanent dry-up that occurred between 2001 and 2015.

FOR CONSIDERATION

- 70,000 acres dried in 15 years (18%).
- Demand for water will drive land use patterns: agricultural lands will become increasingly fragmented; local development will be constrained by water availability and cost.
- Ditch companies face new challenges in terms of managing ditch hydraulics.
- These numbers do not consider pending dry-up (e.g., 65% of WSSC shares are owned by municipalities; yet the majority of these continue to irrigate farms).

Thank you!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Fagerberg Produce, Eaton, Colorado

Harnessing Land Use Strategies for Municipal Water Demand Management

Christy Wiseman, Land Use and Water Planner,
DOLA Community Development Office

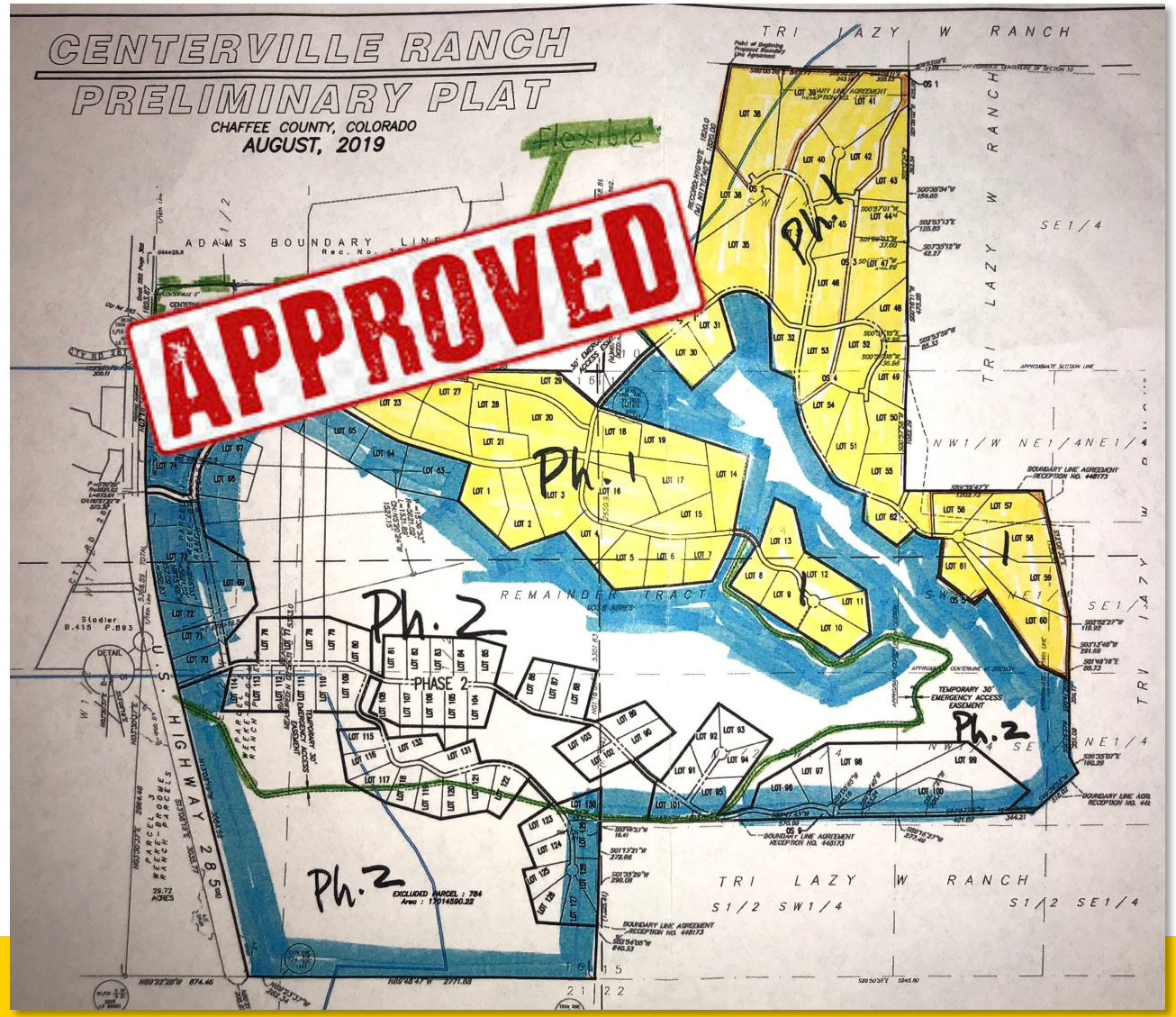
COLORADO
Department of Local Affairs
Division of Local Government

Water Supply Challenges

- Climate: drought, water supply variability, earlier runoff, etc.
- Consideration of agricultural and environmental needs
- Cost of water delivery infrastructure
- Cost and controversy of new or expanded storage projects

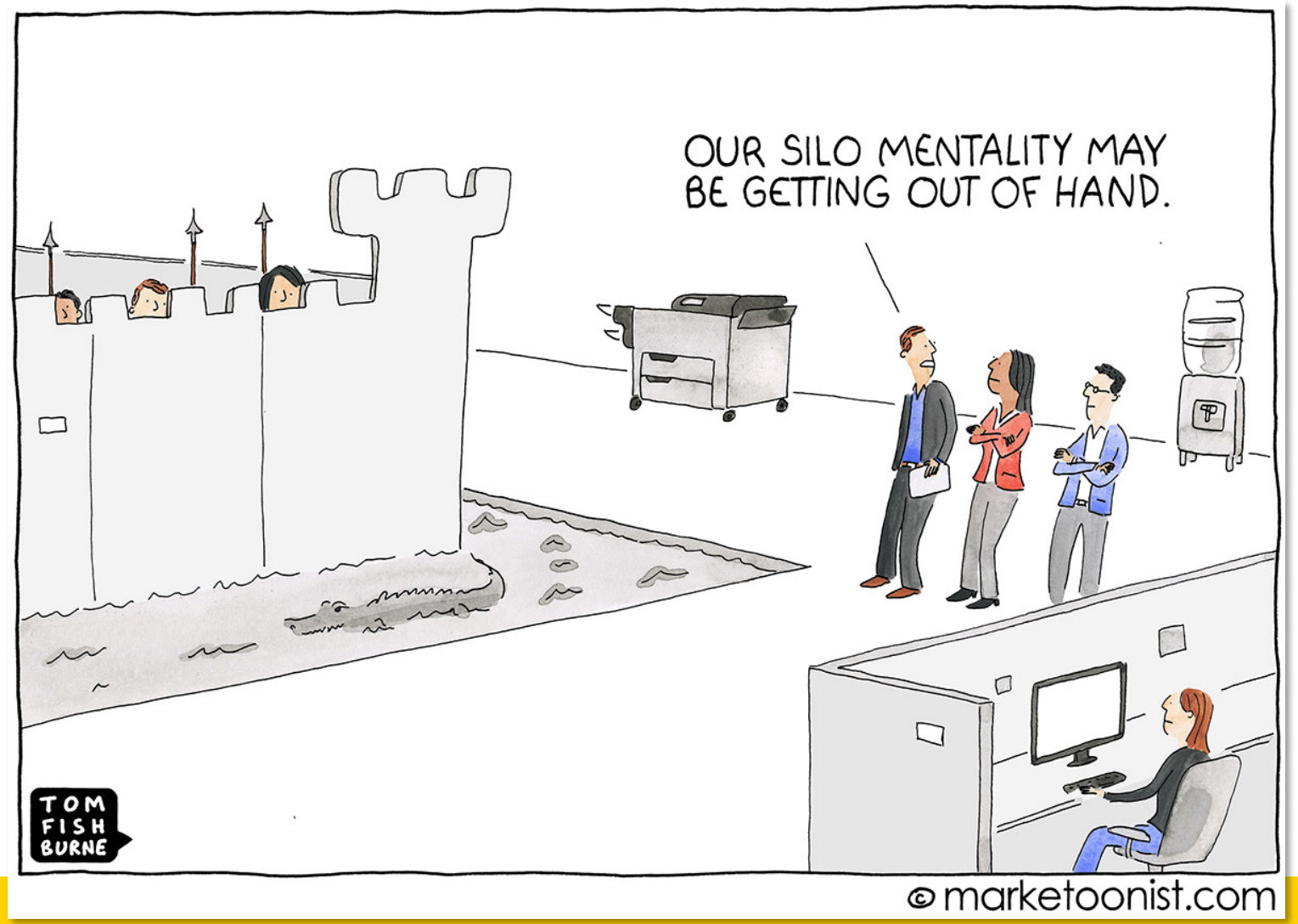
Water Demand Challenges

Water providers don't have land use planning **jurisdiction** over the areas they serve



Water Demand Challenges

Lack of **communication and coordinated planning** between water providers and land use planners

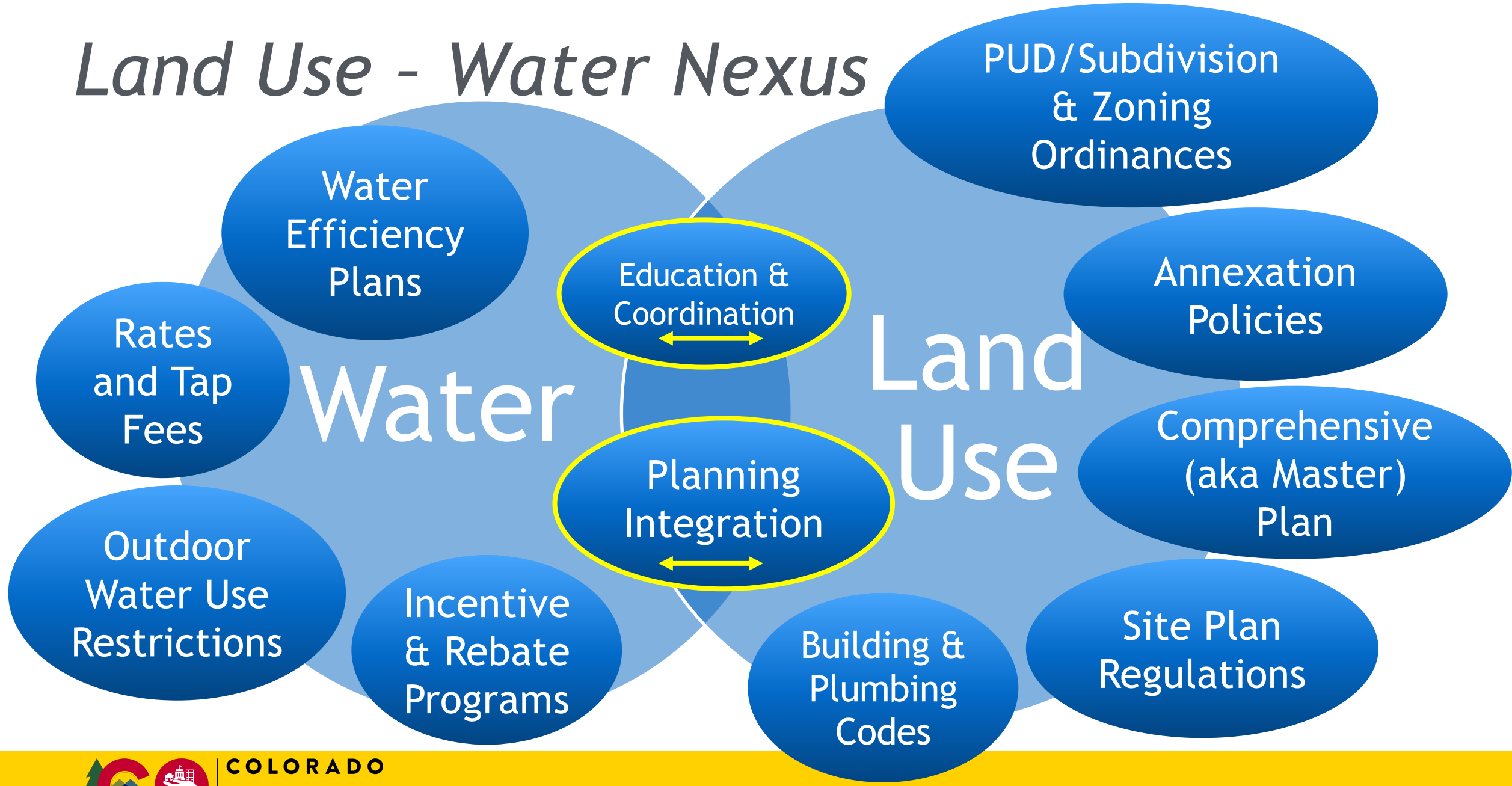


We're growing and the *way* we grow matters.

Land Use Affects Water Use

- Need more water-efficient land use patterns
- Decreasing demand, using “alternative” supplies is best done at the planning stage
- Need solutions so Colorado communities thrive despite water scarcity

Land Use – Water Nexus



Strategies

From *Growing Water Smart: The Water-Land Use Nexus Guidebook (Version 5)* by the Sonoran Institute (April 2021)

^ free guidebook

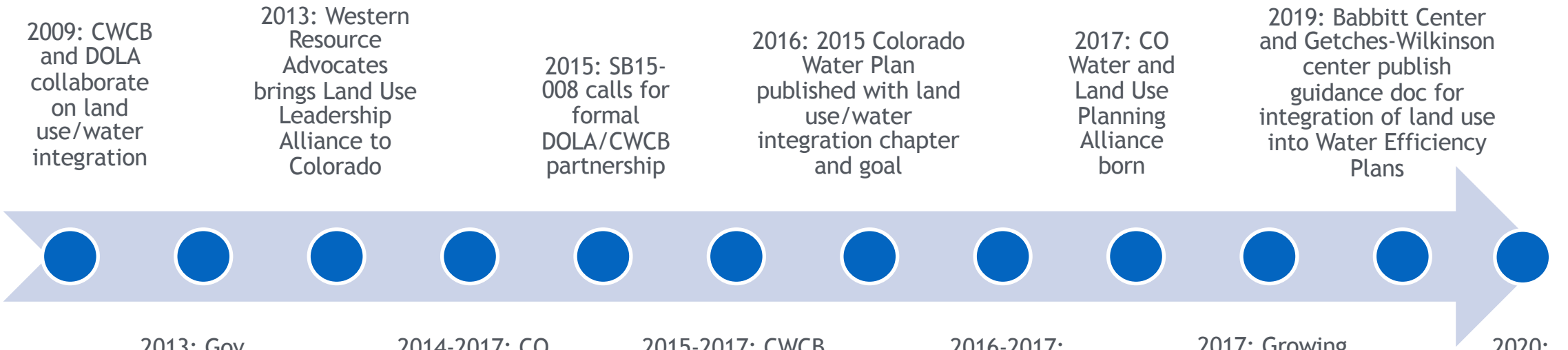
POINT OF INTERVENTION	TOOL	PURPOSE
Planning & Policy Making	Water Conservation Plans Comprehensive Plans Capital Improvement Plans	Establishes goals and objectives for managing the intersection of natural resources and the built environment.
Pre-Development	Water Adequacy Requirements Conservation Tap Fees	Links new development to water supply planning.
At Development Review	Zoning and Subdivision Regulations Annexation Policies Planned Development Policies Development Agreements	Determines what water resource management, conservation and efficiency requirements are applied to development.
At Building & Construction	Building, Plumbing and Landscaping Codes	
Post-Occupancy	Water Conservation Rate Structuring Conservation & Efficiency Incentives Outdoor Watering Restrictions Water Budgets & Auditing	Empowers and incentivizes homeowners and renters to reduce water consumption.

HB 20-1095: Local Governments Water Elements In Master Plans

- **Does not require** that local governments incorporate a water element into their comprehensive plan.
- States that **if a community chooses to do so**, then the local government must consult with the entities that supply their water "to ensure coordination on water supply and facility planning... identify water supplies and facilities sufficient to meet the needs of the public and private infrastructure reasonably anticipated or identified in the planning process."
- Also states that if a community chooses to include a water element in their comprehensive plan, then the element must include water conservation policies (ideally tied to the Colorado Water Plan).
- **Directs DOLA to provide technical assistance to interested local governments with a dedicated position.**

Department of Local Affairs

Land Use and Water Planning Context Timeline



And onward!

Colorado Water & Land Use Planning Alliance

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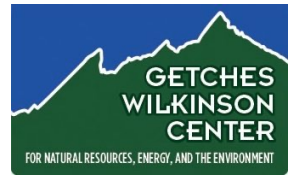
FOR LAND AND WATER POLICY
A Center of the Lincoln Institute of Land Policy



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Alliance Work

- ✓Webinars
- ✓Training modules
- ✓Guidance documents
- ✓Workshops
- ✓Funding
- ✓Direct technical assistance
- ✓Peer exchange

Municipal Project Examples

City of Fort Collins (Larimer County): Integrating a metric on household water consumption into the City's Comprehensive Plan's Land Use Scenarios Forecast.

City of Golden (Jefferson County): Passed a graywater ordinance in 2020; now piloting residential laundry-to-landscape systems.

Town of Severance (Weld County): Adopted a water conservation element into their comprehensive plan in 2021.

City of Evans (Weld County): Currently developing a water efficient fixture direct installation program for income-eligible residents and an indoor water efficiency audit program for all residents.

State Funding for Water and Land Use Planning

[Energy/Mineral Impact Assistance Fund (EIAF) Grants]

- Administrative Planning Grants – awards up to $25,000
- Tier I Grants – awards up to $200,000
- Contact your [DOLA Regional Manager]

[Colorado Water Plan Grants] - Conservation & Land Use

- Contact [Kevin.Reidy@state.co.us]

[Water Efficiency Grants]

- Contact [Ben.Wade@state.co.us]

[Water Supply Reserve Fund (WSRF) Grants]

- Contact your [Basin Roundtable]

Thirsty for More?

- Attend a CO Water and Land Use Planning Alliance meeting: next quarterly meeting is July 14 from 1-4 p.m.
- Want to read/talk more? Need technical assistance on water and land use integration? Contact Christy at Christy.Wiseman@state.co.us
- Questions about drinking water or wastewater infrastructure funding or system needs? Contact Desi Santerre, DOLA's Water and Wastewater Program Manager, at Desiree.Santerre@state.co.us

Thank you!

Christy Wiseman
Land Use and Water Planner
Department of Local Affairs
Christy.Wiseman@state.co.us

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Questions?

Tune in for Part II: Stories from the Field - Innovative Water Sharing Agreements

May 13th at 12pm

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Thank you

Please take the post-webinar evaluation!

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